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THE

PHOTOGRAPHIC NEWS:

A WEEKLY RECORD

OF THE

PROGRESS OF PHOTOGRAPHY.

VOLUME XXIV.

Nulla recordanti lux est ingrata.—MARTIAL.

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PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Foggy Season—Mirrors in Photography—Popularising Old MS. by Means of Photo-Lithography.

A Foggy Season.—Those among our physicists who occupy themselves in finding out what fog is, have had plenty of field for research lately. Off and on, there have been three weeks of foggy weather, including Christmas week, when the fog was generally on and rarely off. It is astonishing how ready people are with an explanation of the causes of fog, and what it really is, and how foggy that explanation becomes as soon as you settle down to listen to it. "What is fog, father?" we heard a juvenile exclaim on Christmas day, as he was being dragged along by his parent under the dark yellow gloom that settled down upon the great city's festivities. Father was in a state of mind—over being late for dinner, probably—and apostrophising his offspring as a silly boy, declared that fog, of course, was fog, and was damp and thick, and that's why you couldn't see through it. Dr. Frankland has recently, we see, given another explanation. He tells us a fog, or rather a London fog of the good old-fashioned pea-soup order, is made up of tiny globules of water which get surrounded by a pellicle of oil. There is plenty of oily vapour in the London atmosphere, coming from the vast consumption of coal, and this oil, he tells us, forms an envelope around the particles of moisture, of which a fog, or cloud, in its normal condition consists. This oil envelope prevents the evaporation of the water globules, and hence we get them encumbering our streets and smarting our eyes. Under these conditions a breeze is the only thing that can free the city from the dead weight that thus hangs over it. Whether savans will be found to agree with Dr. Frankland or not we cannot say, but it is very evident that when a thick damp cloud settles on London's bosom, and this cloud is sufficiently stout to resist the plentiful fumes and exhalations of the metropolis, which are thus kept down in the streets and alleys whence they rise, there need, we think, be little speculation as to the production of a London fog. If we could only hit upon some plan of dissipating it, however, all of us, and photographers in particular, would be very willing to lend our attention to the subject. Despite, however, the many ingenious methods that have been suggested, we still suffer as much as ever. Dr. Phipson, some years ago, told us it had been pretty well established that all fogs were electric to a certain degree, and if, therefore, we could only discharge them by the generation in their vicinity of electricity of an opposite character, a ready means of dissolution was at hand. The difficulty was how to secure this electricity of an opposite character, for unless we could send it with the smoke up our chimneys, or invent some other handy method, the task would be a difficult one. A French gentleman, not long ago, suggested another plan to clear our parks and streets of fog. Dense fogs, he sagely avowed, only settled down when there was an absence of wind or air stirring, and if only a current could be created, there would be an end to the thick vapour. So far our friend was absolutely correct, and it is a pity his plan was less sound than his observation. He proposed to fire off two cannon placed close together but pointing in opposite directions, and their discharge, he believed, would at once produce the desired effect. The plan, however, when it came to be tried, only ended in making the fog more dense, and the thick vapour from the guns rendering the fog still more yellow and opaque. Patience is, so far as we know, the only thing to be trusted in relation to fogs, but if we are to have much more of them during our winter season, it certainly behoves photographers to look about them for the artificial lighting of their studios. With the aid of gelatine plates, electric light is no longer a *sine qua non* in the production of photographs, and there are now several methods of employing gas that promise to be useful in making exposures. We saw but the other day a well-exposed negative of a piece of statuary taken by an amateur in an ordinary room, in two minutes, by the aid of an improved gas-burner; and there should be little difficulty, therefore, in taking portraits in a reasonable time with a suitable multiple burner of the same kind, aided by proper reflectors. No special illuminating agent, or process, ought to be necessary with good gelatino-bromide films, and photographers in a position to take pictures by night or day, fine weather or fog, without much preparation.

Mirrors in Photography.—The value of a large mirror in photographing interiors can scarcely be believed by those who have not employed this excellent aid. Dr. Hermann Vogel, during his voyage to Egypt, was one of the first to call attention to the uses to which reflecting surfaces may be used to light up objects for the camera, and was enabled by the aid of a few common looking-glasses to secure pictures which could not otherwise have been obtained. We ourselves have recently seen the mirror used with good effect by photographers in the depiction of machinery, and, beyond the matter of making the object appear rather flat, owing to the absence of shadows, the results were exceedingly successful. Mirrors of very large size and considerable power are now manufactured by Chappuis, of Fleet Street, a name no doubt well known to our readers, and it was a pair of these, about a yard square, that we saw in operation. They were cheap instruments of fluted glass, which, according to the maker, increases the reflecting power some 20 per cent. The mirror, in photographing, should never be set down at rest, unless it is employed as an intermediary and to throw rays on the instrument that is to illuminate the object. The assistant who holds the mirror may, if the object is small, be enjoined to hold the mirror as steadily as he can, but as he is at best a very unsteady holder, there need not be any fear of the rays being sharply rendered in the photograph. Where there is a large surface to depict, he should move the flare, not too fast, over the surface of the object, bringing into the light one portion after the other. In this way, a very even exposure is secured, and we have seen lathes and steam-hammers standing in remote corners of grimy workshops depicted in quite a smooth and delicate manner. As we have said, there is an absence of shadow which gives the object something of an uncanny appearance, but as there is generally some other reason, apart from an art aspect, in securing the photograph, this defect is rarely of importance. If the mirror is rested on the ground, the result is of course a sharply illuminated spot upon the object, which is otherwise in deep shadow.

Popularising Old MS. by Means of Photo-Lithography.—The "Era Almanack" is to contain, when published, a series of letters, or, rather, fac-similes of letters, by eminent actors, reproduced by the aid of photo-lithography. Epistles from Phelps, Matthews, Keeley, Robson, and others, are to be included in the interesting collection, the letters referring to some special whim or liking of the writer. However characteristic the subject may be, however, the nature of the caligraphy itself will have far more interest than what the words convey, and for this reason we hold it strange that the aid of photo-lithography is not frequently made use of to present to the public a representation of the hand-writing of notable persons. There is no reason on earth why a page or two of the original MS. of "Gulliver's Travels," for instance, and any other writings that may be in existence, should not be reproduced in this fashion and presented to the public, such souvenirs being frequently esteemed far more highly than even the portraits of writers of eminence. No doubt, in many cases, when the MS. is brown and faded, there would be some difficulty in reproducing it, but none so great but that our more skilled photographers could overcome them.

ON ACTINOMETERS.

BY LEON WARNERKE.*

DURING my study of the chemical action of light in application to various photographic processes, I have had occasion during the last ten or fifteen years to try many of the numerous forms of photometers. Feeling the great importance of the subject, and also the growing interest recently evinced in the subject, I hope the following remarks may not be deemed unsuitable.

The simplest, and also most useful, photometer is based on the fact that a chemical change is produced in salts of silver by light, with a resulting change in colour. For special purposes, chromium salts are used in a similar manner.

The action of light can also cause chemical combination, and on this principle is based the chlor-hydrogen photometer, proposed by Dr. Draper, and also by Bunsen and Roscoe.

On the principle of chemical decomposition numerous actinometers are based, and many substances were employed for this purpose, such as peroxalate of iron, by Dr. Draper.

Nitrate of uranium and oxalic acid, by Niepce de St. Victor.

Bichloride of mercury with oxalate of ammonia, by Becquerel.

Perchloride of iron with oxalic acid, by Marchand.

Perchloride of iron with nitro-prussiate of soda, by M. Roussin.

Peroxalate of iron with chloride of gold, by Dr. Draper.

And lastly, Dr. Monckhoven introduced an actinometer almost similar to that of M. Niepce de St. Victor.

Many more substances than the above can be used for measuring the action of light, based on the chemical decomposition produced by light, whilst other photometers are based on the measurement of the electrical current accompanying the chemical action produced by light.

Chloride of Silver, or Chromic Salt, Paper Actinometers.—These are the simplest, and almost exclusively used by carbon printers, and for all processes where the action of light cannot be seen till after some subsequent operation. I do not intend to give either detailed descriptions of the numerous varieties of this useful instrument nor yet their pedigree; I merely intend to describe a few of the less known and recently introduced varieties.

The general principle on which these are based is the operation of the law that sensitive paper exposed to the action of actinic light changes colour, and that the intensity of colour is in direct proportion to the intensity and duration of exposure to light.

Sensitive paper discoloured by the action of light is compared with a permanent tint, approaching in colour that assumed by the sensitive paper. But here comes the first difficulty. The sensitive paper does not assume the same colour invariably—the very same sheet sometimes assumes a blue tone, whilst at others it takes a brown hue; this is dependent on the quantity of moisture and ozone present, and on the temperature of the atmosphere.

To avoid this inconvenience, and to produce as far as possible uniform results, several formulæ were proposed for the preparation of sensitive papers for actinometers. Professors Bunsen and Roscoe, after laborious researches, established the following rules for the preparation of standard papers of uniform sensitiveness. Saxe or Rives papers (thickness of the paper has no material influence) is uniformly soaked with a 3 per cent. solution of sodium chloride. The sensitizing bath of silver nitrate must not be suffered to drop below 6 per cent., and the sensitizing must not be of less duration than fifteen seconds. Such paper will keep at least fifteen hours unaltered.

Dr. Van Monckhoven recommends the following:—The paper used is Saxe or Rives, without further preparation; it is soaked for two minutes in

Sodium chloride	100 grammes
Distilled water	2 litres

It is dried, and afterward sensitized in the dark by immersion in—

Silver nitrate...	100 grammes
Distilled water	2 litres

10 sheets of paper are immersed one after the other, and, after removal, washed in fresh water and dried. This paper remains white for a very considerable period; but it was found by its author to be insensitive, and in order to increase its sensitiveness it is recommended that a lump of carbonate of ammonia wrapped in papier Joseph be kept in the photometer. If this lump be bigger than a nut, the paper will turn yellow. M. Lamy's formula is the following:—The paper to be used is Rives' (8 kilog.). It is immersed for ten minutes in—

Ammonium chloride... ...	2 grammes
Water...	100 c.c.

When dry, it is floated on the surface of—

Distilled water	100 c.c.
Silver nitrate	12 grammes
Citric acid...	6 grammes

for four minutes This paper is sensitive, and can be preserved several months. M. Vidal and the great majority of carbon printers use ordinary ready sensitized albumenized paper.

It is generally remarked that we can much more easily discern the difference in pale tints than in the dark ones, and this property is taken into consideration by all inventors of photometers, although different means to solve any difficulty arising therefrom are introduced.

The Autotype Actinometer.—The simplest of all has a single tint for comparison. When sensitive paper reaches this tint, a fresh portion is substituted; and by this means two, three, or any number of tints can be obtained, according to the necessity. This form requires constant watching, and any error of observation is repeated.

Monckhoven's Actinometer has also a single tint for comparison, and is to a large extent similar to the Autotype. To avoid the necessity of making several exposures, the light acting on the sensitive paper is admitted through ground glass and an aperture, the size of which latter is regulated in such a manner as to have always the same tint, equivalent to the required amount of light.

Dr. Vogel's, Burton's, Leon Vidal's, and Lamy's actinometers are made so as to have translucent bodies inserted in suitable apertures, in order to form an obstacle to the action of light. I do not minutely describe these very ingenious and useful instruments, because they are very well known. In some the observations are made by a comparison of the tints with normal ones; in others by reading the numbers that are printed through the obstructing medium, which is formed of translucent paper, gelatine, mica, coloured glass, photographic collodion, &c.

I pass round for your examination this little photometer by M. Hermagis, of Paris, which is in the form of a locket, and is formed of a triangular prism, made of orange glass, with engraved numbers beneath. The prism is almost colourless at the thinnest, and deep orange at the thickest end. A small strip of sensitive paper is slipped between the card and the glass prism, and when exposed to the light the higher the number printed the greater is the intensity of light.

This other photometer for negative work, by M. Vidal, is also worth your inspection. This rather roughly made actinometer is my own make; the scale is made by means of collodion emulsion. To examine the number printed, the scale is slided backwards, and the number is visible through yellow glass. For economy's sake, only a certain

* Read before the Photographic Society of Great Britain.

portion of the scale is exposed, by sliding the aperture longitudinally.

I cannot close this chapter without showing you a highly efficient, portable, and elegant photometer recently made by Mr. Woodbury—(Fig. 1.)

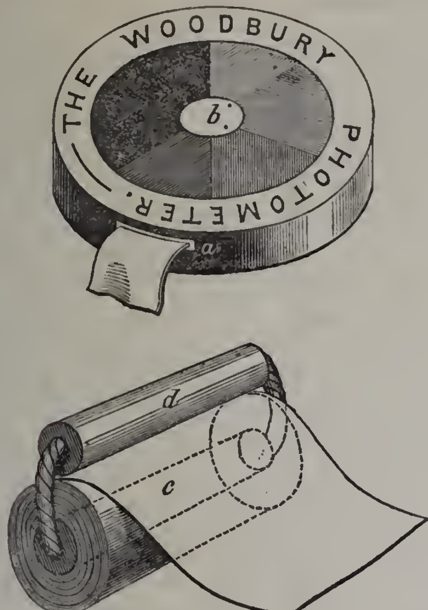

Fig. 1.

It has the form and size of a small watch. On its surface you observe a circle divided into 6 sectors, with a hole in the centre. The sectors are printed by Woodburytype, the colouring matter being Indian ink and alizarine (permanent). A strip of permanent sensitive paper is passed through the slide, *a*, at the side of the brass box, and is acted on by light through the hole *b*, in the centre of sectors. A strip of paper is wound round a small glass tube, *c*. Another minute glass tube, *d*, presses by means of an elastic spring on the roll of paper, which prevents the unwinding of the paper; but by pulling the strip it easily comes out. This part is enclosed inside the box, and, thanks to this contrivance, the whole apparatus is very small.

According to this author, the photometer in this form can be used for timing exposure for negatives or for other very sensisive preparations. For carbon printing, a disc of yellow gelatine is inserted between the glass and the scale.

Mr. Lane, in his printing frame—which I pass for inspection—has also introduced a photometer, and it is an excellent plan to have such a photometer in every frame used for carbon printing.

Professor Roscoe devised a special apparatus for measuring the intensity of daylight. This apparatus, improved by Captain Abney, was shown to this Society some time ago. It answers the purpose admirably. The strip of silver paper, as you doubtless remember, wound on the mechanically and uniformly revolving drum, is subjected to the action of light passing through a scale. A very ingenious mode of comparing the intensity of the tint obtained, and its translation into numbers, is also the work of Captain Abney.

Chloride of silver paper is also used by the majority of carbon printers, and this is a mistake, as the sensitiveness of the chromium salts is subject to certain freaks, not followed by the sensitive silver paper. For instance, the temperature and the hygroscope condition of the atmosphere have a very marked influence on the sensitiveness of the chromium preparations which is not observed in the chloride of silver paper.

Dr. Vogel, in his photometer, to obviate this imperfection, used, instead of silver, a chromium salt, plain paper being used. This was immersed in—

Chromium dichromate	1 part
Water	30 parts

This paper, when dry, will keep several weeks without alteration.

M. Leon Vidal preferred to use silvered paper, but he introduced a correction by means of a separate apparatus, called by him *Graduateur des rapports*, by the aid of which he can find the difference of action between the silver paper and the carbon tissue he intends to use on certain days.

PHOTO-ELECTRO METALLURGY.

BY W. WATTS.*

Actuated by the hints of our energetic Secretary, Mr. W. J. Chadwick, who is always on the alert for anything to enliven and interest the Society's meetings, and taking it for granted that the members are desirous of exchanging ideas, whether strictly photographic or not, so long as something bearing upon photography is the subject, I have, with this object in view, been induced to jot down a few of my experiences, which I hope will prove interesting. This being my apology for any apparent digression which may occur from the most favoured subjects, I confidently trust to your indulgence, giving my assurance that if my efforts are appreciated I shall be amply repaid. I cannot refrain from expressing my regret that such a limited number of the members assist in catering for the general fund of scientific entertainments, for which a society of this kind, above all others, should be most celebrated. I hope the spirit of emulation will continue to improve, and for my own part I shall always be pleased to do my best, even at short notice, in the event of a scarcity of practical or theoretical demonstrations.

I will commence my subject by illustrating combined chemical and electrical action in a few common-place instances which are daily in action around us silently but most persistently, demonstrating some of the greatest principles in chemistry, but which, from want of the application of that great teacher, observation, are passed unnoticed by thousands.

For my first example I will take an ordinary tinned iron vessel used for culinary purposes. The thickness of the tin upon the iron determines how long the latter will be protected from oxidising. After the tin is worn away from the most prominent parts, and the vessel is put out of use for a short time, the tinned portion being electrically negative to the iron, renders the tin a means of destruction instead of protection, for by one of the laws of electricity the negative metal is preserved at the expense of the positive when in contact. This electrical action would not occur to such an extent were water and iron pure; but as neither are to be thus had, the impurities in both only serve to make the destruction more complete. The same action may be observed at the bottom of iron bars which have been let into stone and secured with lead. These become corroded away much sooner at the point of contact with the lead than in any other part. This happens more especially in towns where sulphur from so many fires is continually combining with moisture, forming acidulated water. In this case, also, the lead is negative to the iron; the former, therefore, is protected at the expense of the latter. Now, were the bars secured in the stone with zinc, both metals would then become wasted away equally; at anyrate, both metals being positive, one would not hasten the destruction of the other.

Professor Graham, treating on the action of iron in water, says:—"Articles of iron may be completely defended from injury in this way by the more positive metal, zinc, the

* Read before the Manchester Photographic Society.

preserving action being continued even after portions of the zinc are worn off." I will show this action more fully by the next example, which will be illustrated by an experiment, with the exception that in this case it will not only prove the primary law already stated, but the atomic, which will be generated, will be, as it were, put in harness and made to do work.

To explain this action I will take a half-crown piece and tie some iron binding wire round it, then make it red hot in the Bunsen flame, and then quench it in the beaker containing dilute sulphuric acid. This has the effect of dissolving a small portion of the copper out of the coin with which the silver is alloyed in the proportion of ninety-five parts of silver to five parts of copper; the quantity of copper, therefore, in the solution will be extremely small, but it will be amply sufficient for my purpose. After the coin has remained in the solution for a few minutes it will be coated or plated over with the copper which was previously dissolved from its surface. I could give numerous other instances of this simple form of action; but, as the time allotted to me is rather limited, it will be undesirable to do so, or to explain the more extended experiments which could be shown, and which only follow out the action you have already seen, unless it is to add that the various solutions of metals are almost, without exception, at the present time deposited from in a separate cell; also a separate battery or motor of electro-atomic force is used, it being only necessary to bear in mind that, in forming a battery, whatever the metals, the positive element is that which is not acted upon by the excitant, and which must, therefore, part with its representative pole in the depositing cell. The negative element being the loser in originating the force put out, it must, therefore, be the pole in the depositing cell to receive its equivalent for the loss it has sustained in producing that force.

Having been engaged for nearly thirty years in electro-metallurgy, and having practised photography at intervals during that period, beginning with the Daguerreotype process, it became an easy step from that art to the electrotyping of silver plates for printing purposes; and about fifteen years ago I possessed a splendid collection of specimens, which, however, through an unfortunate misunderstanding with a workman, got cut up and melted to alloy gold. Notwithstanding, at my earliest convenience I intend to reproduce them, commencing with the Glyphographic process, invented by Palmer in 1812, down to the present time, chiefly embracing those processes which bear some special feature sufficient to warrant their reproduction.

Those specimens which are now before you are of recent production. With the exception of two they possess no photographic points of interest, being simply plain specimens of the deposition of copper upon fruit, the fruit being still encased in the copper. They show, however, how smooth and even a thin coating of copper can be deposited upon non-conducting objects by being simply brushed over with plumbago, then successively immersed in a solution of phosphorus and perchloride of gold.

The casket bearing so much intricate ornamentation was designed and constructed chiefly to show the various tints and shades of colour which can be produced upon gold and silver by acting upon those metals with salts and acids, producing the effect termed "oxidising." This work has lost much of its freshnesss by being in an exhibition for some time without a shade. The tints of which I speak can be distinguished better by daylight.

Those pieces of silver with cardboard coverings are what are called "metallo-chromes." The observation of these pleasing effects will bring us a little nearer to photography. They are formed by depositing a film of peroxide of lead upon a polished plate of silver, steel, or nickel. There is one now in the glass beaker before you, being formed by the electric current. The only account I have been able to meet with relating to these singular effects is taken from Mr. Alfred Smee's work on electro-metallurgy, published in 1843. In explaining the deposition of the oxide lead he says:—"The production of this oxide has been used by Mr. Gassiot to form metallo-chromes, which, for striking effect, and beauty of colours, are unequalled by any other work of art."

The small round plates with cardboard coverings are called "Nobilis' rings." These are of two kinds, the simplest form being produced by moistening a polished silver plate with a solution of acetate of copper, when, on touching the plate with a piece of zinc, there becomes deposited upon the plate a number of rings centrally with the zinc, the point of contact showing no deposit. These rings can be produced in various ways; but the same principle would appear to govern the action in all cases. They have been compared to Newton's rings, but are only similar by reason of producing decomposition of light; for in Nobilis' rings there does really appear to be in the acetate of copper form a pigmented colouring matter, which can be easily removed by a pencil point moistened with hydrochloric acid, in the same manner as removing the blue from steel. Some of those before you have been submitted to the action of strong cyanide of potassium, which did not affect the deposit, and one of them was polished with a dolly buff in a lathe for some minutes, which made very little difference to it. This seems the more striking as the rings were only a few seconds in formation, and the solution very weak. The best of these chromes can be produced by depositing a film of binoxide of lead upon a plate of polished silver or nickel. The plate must be attached to the positive element of the battery, bearing in mind that the negative pole need not be of any specified form; but, whatever be its form, the contour of the chrome will be regulated by it, and according to the relative distances of every part of the negative pole so will colouring be disposed of. If the negative pole terminate in a point facing the centre of the plate, rings will be formed of different thinknesses of the deposit showing the colours of the spectrum. The foregoing arrangement must be connected up with two pint Bunsen batteries, and if the power be brisk the effect will be produced in about fifteen minutes. The solution is made by dissolving finely-powdered litharge in a solution of potash; the binoxide of lead is produced by the reduction of some oxide of lead during decomposition into metallic lead on the negative pole, and, oxygen being liberated at the positive pole, it combines with the oxide of lead in the solution to form binoxide, which, as decomposition proceeds, becomes deposited on the positive pole. All the prismatic colours are seen by reflected light, and by transmitted light a series of prismatic colours complementary to those seen the first position appear to occupy their places.

Now, having read of many attempts to reproduce the natural colours of objects by photography, I have been most forcibly impressed with the idea that those who have professedly made that grand discovery have been operating with some of the sub-chlorides, acetates, or other sub-salts, and have produced a conglomeration of these same Nobilis' rings with a silver-plate photograph. Hermann Vogel says, for instance:—"Nicephore Niépce, who worked, like Becquerel, with plates of silver, which he chlorinated by immersion in a solution of iron and copper, and then heated them strongly, thus obtained plates which appeared ten times more sensitive than Becquerel's, and enabled him to copy church windows, &c. He relates that he not only obtained the colours of objects in his pictures, but that gold and silver retained their metallic splendour, and the picture of a peacock's feather the lustre of nature." Now, the mere fact that church windows and a peacock's feather are named seems to imply or suggest that the colours which were obtained were prismatic, and the half-closed boxes in which these pictures were exhibited a simple contrivance to obtain the proper angle for observation, to prevent any movement showing the complementary colours. I have no explanation to offer as to how the pictures were produced; but, if the effect was based upon the prismatic operation of light, I think the achievement, from a photographic point of view, very considerably reduced in its importance. A pigmented picture is the desideratum, and there is no known law connecting chemical composition

with colour; therefore, there is much to be done before we can obtain these much-hoped for results.

On the completion of this paper I shall show the deposition of gold on the screen by the aid of the limelight. I will explain the action when I have the subject before me, and which is now being got ready in the next room. Those who might be desirous of producing the effect which I have just named could not do better than consult Mr. W. J. Chadwick's *Magic Lantern Manual*. His article on electro-deposition is well explained and easily followed out. In conclusion, I will only add that electro-metallurgy has done much to assist photography in introducing several forms of printing from photo-relief, &c. It may yet do more; hence it will not be presumptious, then, in declaring that it justly deserves a prominent position on the photographic platform.

ARTISTIC PHOTOGRAPHY.

BY GEORGE GREGORY.*

The subject I have chosen is capable of being treated in a variety of ways, and opinions differ amongst some professionals as to the advisability of cultivating its requirements in their everyday business, asserting that financially it is a mistake. This particular aspect of the subject, together with some others that may strike members, I will leave for the after discussion, which, I hope, will take place. My object in taking up the subject is the good of all the members, including myself. Here I wish to state that it is not from any idea I hold as to my own fitness over and above that of the other members adequately to ventilate the theme; but, feeling that all of us are in a manner bound to contribute something to the general interest of our meetings, either as readers of papers or in the sustaining of lively discussion thereon, I am bold enough to think that you will overlook any shortcomings of mine, accepting my remarks in the spirit in which they are offered.

I am one of those who think that the time has come when photography and art are not so widely separated as they were; in fact, photographic pictures are now produced equalling, as regards light and shade and imaginative feeling, the sole product of the artist's pencil. True, the great bulk of photographs are anything but artistic productions; yet such fact is no reason why all the outcome of camera work should receive the condemnation of most of the artists of the brush and of those who think with them.

In portrait photography, of late, judicious retouching of the negative has come very much into use; and the result is satisfactory just in proportion as the pencil of the retoucher is wielded with the taste and skill of an artist. I am certain that the same ability applied to the retouching of landscape photographs would tend greatly to enhance their pictorial value.

It is not possible to give hard and fast rules by which to produce pictures; still there are certain things we should always bear in mind. One I may mention here:—As distance is obtained in painting by diminishing the intensity of the colours and by a certain indefiniteness of outline, so we should be careful, in focussing, that our distances are not rendered too sharp, but with a mellow haziness which is both truthful and pleasing.

I will suppose we are about to photograph a large view —one which embraces miles of distance, but with no prominent architectural features to require sharp definition. Now if, instead of stopping down the lens to get as much sharpness as possible all over the view, we put in the largest stop and focus accurately some point near, but not quite, in the immediate foreground, we shall find (other things being right) we have obtained a much more artistic rendering of the scene than the kind of photograph that is sharp all over. This matter of careful focussing, coupled with a judicious balancing of lights and shadows, will make a picture out of very unpromising materials.

Most of us will have seen, now and again, pictures, both portrait and landscape, in which the lights and shades have been so nicely balanced that we have felt their influence even before we have had time to look into them and find out in what their excellence consisted.

So much depends on individual feeling and taste that it is not possible to say, dogmatically, that such and such pictures are perfect; but this one thing is certain—that, inasmuch as we strive to improve our tastes by studying the works of true artists, and, above all, become earnest students of nature, our work will become of more value to us, and, what is no less important, will tend to raise the status of photography in general.

We may not all occupy the first rank; for it is given to but few to be perfect in all high-class photographic essentials, from the choosing of the subject all through to the finishing of a perfect print. So many things have to be well performed that the careless or indifferent worker need not expect anything pictorially transcendant.

I propose to slightly glance at the various manipulations necessary to produce a finished print; and, for the sake of simplicity, let us suppose we produce the negative on a gelatine dry plate and finish the print in silver. To begin: Having arrived at the scene of action we proceed carefully to examine our view, and here it is our "art feeling" may assert itself with telling effect. The selfsame landscape may have (and has) many pleasing aspects under varying conditions of light; and it becomes possible for the photographic manipulator to exercise his talent in patiently waiting until his subject is effectively lighted, which is no less important than the choice of the proper point of sight. Here is the time above all others when patience will be required. The landscape-painter could put in a particular effect; the photographic landscapist can only do so to a limited extent by touching, and must, therefore, wait. We will suppose the reward of our waiting to be all we could wish—say a magnificent bank of cloud in such a position as to cast a shadow in the middle distance, allowing the light to fall with beautiful effect on the distant portion of the landscape. Now comes the exposure of the plate, and here the matured experience of the practised worker will be required to give the best possible exposure to the sensitive plate; for, as most of us know, it is very easy to spoil all by an error in exposure. True, we may rectify to some extent under or over-exposure; but the right exposure is decidedly the best. Taking for granted that we have made a correct exposure, we shall now require to develop with care and judgment, bearing in mind our idea of the scene represented. Tastes differ as regards development, but personally I should say that a full development is best for a scene in which great contrasts occur—a less full one where the contrasts are not pronounced. Some might say that the right moment would be at one stage, some at another; certainly, to get a good result, the plate must be well and judiciously developed. Then the printing must be most carefully done; in fact, if we wish for and strive to get our perfect picture, it must receive as much care and attention as any other part. Good printing and toning is of the highest importance, and, if done with taste and skill, is one of the chief factors in all successful results.

It is very probable that I have stated nothing but what you were aware of already; still it is of importance sometimes to be told in other words of things already known to us. We are apt to forget the most familiar maxims, and find out, when too late, that our picture might have been better done. But we must not despair when such is the case, as it is far better to find our work not quite up to our ideal, than that we should be surprised at having succeeded so well. There are many things I have not entered into. Many things incidental to the process there are which cramp our efforts and force us to be content with something less than we wished for; but, after all, earnest striving will enable us to progress. I heartily wish all the members of the Manchester Photographic Society will feel it to be their duty and their pleasure to advance and elevate photographic art.

* Read before the Manchester Photographic Society.

The Photographic News.

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THE PAST YEAR.

The year which is just past has witnessed one of the most important revolutions which have occurred in the history of photography; notwithstanding which, its chronicle must be brief. The revolution has not consisted of many changes or multiplicity of events, so much as in the prevalence of one radical change: dry plates have largely superseded wet collodion for work in the studio. Iodide of silver, hitherto the photographer's primary basis of sensitiveness, has given place to bromide of silver, and gelatine has taken the place of collodion. The object and issue of these changes is an increase of sensitiveness which is marvellous—exceeding that of ordinary wet plates by upwards of a thousand per centum. In the very early days of the art the younger Niepce, writing to Daguerre, exclaimed: "What a difference between the method which you employ and the one by which I toil on! While I require almost a whole day to make one design, you ask only four minutes!" And for the work which Daguerre then required four minutes, the photographer of the present day, with gelatino-bromide plate, would probably require one second.

The introduction of bromine into the Daguerreotype process effected a wonderful change in the sensitiveness of the plates, and in the beauty of the results. But these sank into insignificance in presence of the sensitiveness and rare excellence of wet collodion as introduced by Scott Archer and Dr. Diamond. The beauty, simplicity, and efficiency of the collodion process were indeed marvellous, and will always retain for it many admirers and workers. Some important revolutions have occurred in the history of the collodion process. Many of the old workers persistently opposed the addition of bromides to the collodion, and equally opposed the use of iron developers. Much bitter controversy ensued before the change was effected, and now for years past the use of bromo-iodized collodion and iron development has been universal.

The possibility of employing dry plates in the studio, of having perfect and highly sensitive plates ready for use at a moment's notice, yet not deteriorating, however long the sitter took to get ready, has always presented great charms to the portraitist, but he has scarcely dared to hope for the realization of such a dream. The gelatino-bromide plate now placed in his hands by a few enterprising pioneers surpasses his wildest hopes. Its rapidity is greater than fancy ever suggested, whilst the excellence of the results is not one whit inferior in any particular to the best of his former work. There are, of course, drawbacks. New conditions have to be mastered; in point of fact, a new art was to be learnt. Gelatine was a material not well understood, and to some extent remains so. Bromide of silver in its best condition possesses a degree of sensitiveness never before understood, and in proportion to the sensitiveness is involved the necessity of caution in preparing and using the plates. A specially non-actinic light is required for preparing and developing the plates, which would be fogged in a light sufficiently non-actinic to permit the development of a wet collodeon plate; but conditions well understood are not difficult to follow.

The chief progress of the year has been in the better understanding of the conditions, and acquiring experience and certainty in the manufacture, of the gelatino-bromide plates. Doctor Van Monckhoven has contributed materially to the scientific knowledge of the matter by noting the changes in appearance of the bromide of silver when extreme sensitiveness is produced by long emulsifying, and discovering how a similar result might be produced at one operation by a simpler method. The results of the worthy doctor's research have been confirmed in practice by some of the most able workers. Considerable difference of opinion still prevails as to the best developing agent. Many able photographers still prefer the use of alkaline pyrogallic acid; but, as a rule, those who have altogether given up wet collodion, and work the gelatine plates solely, prefer the the ferrous oxalate developer. Various ingenious contrivances for preserving and using the ferrous oxalate solution have been invented during the year, which materially tend to facilitate practice.

In the wet collodion process there is no change or progress to chronicle. Neither is there anything to note in the practice of silver printing. Carbon printing fully maintains its position, and is probably more used than at the beginning of the year. The platinotype process has obtained more attention during the year, and has obtained recognition for its undeniably beautiful results. It has not passed largely into general practice. An impression seems to prevail that something of secrecy is added, as well as a patent restriction, as a barrier to its use. As it yields prints as fine in colour and texture as a steel engraving, and has promise of permanency, it may with great advantage be used for many forms of photography.

Photo-mechanical processes have not made much progress in the country during the year. On the Continent and in America, processes, under various names, such as "Artotype," "Phototype" processes, &c., probably in each case a form of the photo-collographic process, have produced many fine results. The Woodburytype process and the Lichtdruck process used by the Autotype Company continue the best methods used in this country.

Considerable interest has been manifested during the year in modes of using artificial light for portraiture. The electric light has been found efficient, but somewhat cumbersome and expensive. At the moment we write news comes across the Atlantic that Edison has at length actually effected what has been so long promised—the subdivision of the light, cheap supply, and easy application. It will be wise to have it within reach, however, before speculating as to its possible uses. Pyrotechnic fires, with the aid of judicious reflectors such as the luxograph, have been found useful. Perhaps the most marvellous application of artificial light is that in which common illuminating gas was used by Mr. Laws, of Newcastle-on-Tyne, applying Wigham's patent burner, with great skill and admirable result. The columns of the PHOTOGRAPHIC NEWS during the year contained full details of many ingenious contrivances for the cheap and easy application of artificial light to portraiture.

Photography as commerce, sympathising with the general depression of trade, has been dull. But we are glad to contemplate the probability of a general revival in trade.

Photographic societies have been active, and their proceedings interesting. At the South London Society so much enthusiasm prevailed that, when the usual time of recess came round, a weekly meeting was organised at the studio of one of the members, and interesting meetings were held. Associated with this in spirit, if not springing directly out of it, has been the establishment of a photographic club for special meetings of photographers. In some

of the continental meetings beer and tobacco are permitted during the progress of the meeting; and the meetings, if less dignified, are thought by many to be more attractive than the more formal meetings in this country. In this club a fusing element will be found in which science and social practices are not in antagonism.

A successful exhibition was held in London, which gave general satisfaction.

The Grim Reaper has been busy amongst names known to photographers during the year—Sarony, Schultz-Sellack, Negretti, and R. Cade are amongst the most prominent names lost to the art.

Critical Notices.

LETTS' DIARIES.

There is no series of diaries more deservedly popular than that issued for so many years by Letts and Son. Old men were familiar with them in their boyhood when the publication of diaries was not common, and they have grown yearly in popularity and usefulness. There is scarcely any form of commonly required information they do not supply. And their variety in size and style meet every possible requirement in the keeping of a diary, from the smallest memorandum to the most copious notes of events. Amongst the examples before us especially worthy of attention is the Registered Tablet Diary and Blotting Pad, a singularly convenient combination for every man who has much writing. Saxby's Weather Tables are well worthy of attention, as being in the majority of cases strictly accurate in their indications. The diaries are issued in every form suitable for pocket or desk, and in almost every style of binding.

PICTORIAL EFFECT IN PHOTOGRAPHY. By H. P. Robinson. (Piper and Carter, 5, Castle Street, Holborn.)

This, the best book which has been issued on the artistic side of photography, has been unfortunately for some years out of print, and we now heartily congratulate photographers on the issue of a reprint. It has again passed through the author's hands, but there was not much to add, and his work has consisted chiefly in some condensation and excision so as to bring out the work in a somewhat cheaper form, and so place it within the reach of every photographer who may wish to acquire such hints as may enable him to give a more pictorial and artistic character to his work.

As most photographers, by this time, know, art has specific laws by which composition and light and shade are governed. A knowledge of such laws can be gained by earnest study; but a perfectly familiar knowledge of such laws, as far as as they can be formulated, will not make a man an artist. Mr. Robinson teaches the student all of those laws which can be taught, but he is most anxious that the ambitious photographer should be imbued with the spirit underlying those laws, and teaching the laws, and their application to photography, he endeavours to lift the student into an intellectual and poetic appreciation of the possibilities of his art.

As all our readers know, Mr. Robinson is a very able photographer, but, as many of them may not know, he is also a painter of considerable ability, and an occasional exhibitor at the Royal Academy and other exhibitions of paintings. Hence he speaks as one having authority on all subjects connected with pictorial effect in photography, and other phases of art.

PHOTOGRAPHIC PRINTER'S ASSISTANT. By William Heighway. (London: Richardson and Best.)

Our readers are familiar with Mr. Heighway as a lucid and able instructor in all matters of photographic manipulation. He has here presented photographers with a very complete manual of silver printing in its every branch, giving minute details of every operation in producing perfect silver prints. An essential character of the work is its practical quality. Hence it is clear and simple. We can cordially commend the little work as trustworthy and excellent. We hope on some other occasion to quote something from its pages.

TRAITE PRATIQUE DE PHOTOTYPIE, ou Impression a l'encre grasse sur une Conche de Gelatine. Par M. Leon Vidal. (Paris: Gauthier-Villars.)

In the volume before us our learned *confrere* has given the world a very valuable and full treatise on that branch of photography which, in this country, we know best as photo-collography. There has been no work devoted to the subject in this country, and not many volumes of any importance have been written at all on the matter; but the volume by M. Vidal fully supplies the hiatus. It is very comprehensive, clear, and practical, and we shall hope, when time and space permit, to place before our readers a full review in place of the brief notice to which we are at present confined. In the meantime we commend it to readers interested in this subject.

OUR ACTORS AND ACTRESSES. By C. E. Pascoe. DRAMATIC NOTES. Edited by C. E. Pascoe. Illustrated by T. Walter Wilson. (London: David Bogue.)

There are very few people who do not take a lively interest in the lives and histories of actors and actresses. From the time when Hamlet was written, the announcement "the players have come," aroused immediate attention. Besides the general interest in dramatic works in all periods of the world's history, there is in our time a close and sympathetic interest in the *personnel* of the stage which gives any trustworthy chronicle a special value, and it is, we presume, because of the universality of this interest that these volumes have found their way to a photographic editor's desk for notice. The style is good, they appear to be very complete, and have a trustworthy air. The first mentioned—"Our Actors and Actresses"—is a brief biographical notice of the lives and stage doings of all the living actors and actresses of this country. "Dramatic Notes" is a practical history of the London stage during the past year.

CHRISTMAS AND NEW YEAR'S CARDS. (London Poulson & Son.)

These are a series of cabinet photographs of floral subjects arranged in designs and appropriate lines. Besides including some of the best arranged designs in this way, these are admirably coloured by hand, and form the most charming cards of greeting we have seen issued.

FRENCH CORRESPONDENCE.

The Cold Weather and Photographic Operations. — Late Meeting of the Chambre Syndicale de la Photographie.—New Photographic Journal.—Retrospect of the Closing Year.—Prospects of the Coming Year.

Influence of the Cold Weather on Photographic Operations.—The very low temperature that has so long prevailed over the whole of France has caused a most unwelcome stoppage in all kinds of photographic experiments as well as in work in general. Wherever one goes, and whomsoever one meets, the same complaint is heard—"Impossible to do anything, everything is frozen." It will be readily understood that so intense a cold is a great hindrance to the proper desiccation of gelatino-bromide emulsions. Besides this, business is almost at a standstill, for the execution of orders is impossible, and manufacturers are overwhelmed with them. To such a pitch are we come in Paris that water and

fuel are beginning to fail, and, if the same abnormal condition of affairs continue much longer, the supply of provisions can only be kept up with great difficulty. The conveyance and carriage of goods is very uncertain, and the railway companies have notified to the public that they will not be responsible for delay in the delivery of cases and parcels; packages are rapidly accumulating in the goods stations, and the traffic in the streets of Paris is so restricted that no one knows when and how to effect a clearance. We are, in truth, all looking eagerly for a change in the weather, that a rise of the thermometer and a general thaw may restore our ordinary conditions of existence. I have heard it stated that while a low temperature exists gelatino-bromide plates will habitually veil. But I know no reason why they should do so, and perhaps the phenomenon, though it coincides with the cold weather, is accidental and due to some other cause.

Meeting of the Chambre Syndicale de la Photographie.—Notwithstanding the frost and snow, meetings of the different photographic societies have been held, and the lectures on photography have been delivered as usual, only they have been less numerously attended than is generally the case. It must really be acknowledged that there exists among us a veritable devotion to the photographic art to cause, in spite of the severity of the weather, so comparatively large an audience to attend M. Davanne's lectures at the Sorbonne, and so many members to be present at the meeting of the Chambre Syndicale de la Photographie held on the 22nd of December last. No doubt the numerous attendance at this meeting was due to the important character of the subject under discussion, not only for the association itself, but also for the whole body of photographers in France. This subject was the report of the committee appointed to consider the means of carrying into effect the project brought forward by M. Vidal, and having for its principal objects—(1) The formation of a new syndical association or union to extend over the whole of France, and to include also other countries; (2) The establishment of a new photographic journal which should be recognized as the official organ of the union. This journal is to be devoted more especially to questions of commercial and industrial photography—questions that are not touched on by the other already existing photograpic papers, for they occupy themselves only with the technical and scientific aspects of our art. Resolutions in favour of the report and of the execution of the proposed undertakings were passed unanimously, and it was decided to make an appeal to the whole body of photographers, calling on them to unite their efforts with those of the Chambre Syndicale of Paris to obtain a more vigorous and effective representation of the photographic industry. Every photographer joining the union and living in France, or in one of her colonies, will bear the title "Membre du Syndicat de la Photographie;" he will receive every month a copy of the *Journal de l'Industrie Photographique* (the official organ of the union), and will pay an annual subscription of 7 francs. Foreigners will be admitted as corresponding members with the same advantages, and will pay the same subscription.

A New Photographic Journal.—At the same meeting was read the agreement entered into between the members of the committee and M. Gauthier-Villars, printer and publisher, of Paris. By this agreement the latter engages to start and publish the new *Journal de l'Industrie Photographique* as the official organ of the association. The first few pages of each number will be devoted to the transactions of the association, and to official notices and documents; the remainder will consist of articles relating to legal and administrative matters, to programmes of exhibitions and competitions, to lists of awards, patents of new inventions both at home and abroad, custom-house tariffs, &c., &c.,—in short, it will contain an account of all questions affecting photography in France as well as in other countries, and capable of interesting all those who have any connection with the photographic art either in the way of business, of research, or of pleasure. Notwithstanding the very active part that I have personally taken in putting this scheme into execution, I do not think I shall be misunderstood if I lay some stress on it in my correspondence for the Photographic News, since it relates to a subject of public interest. Its principal objects are to raise photography to a higher position among the industrial professions, to create closer ties of mutual interest between all the members of the photographic body, and to effect more complete interchange of ideas on those subjects affecting either our studies, or the defence, when necessary, of our professional interests. What gave me, perhaps, the greatest pleasure was the unanimity with which the whole project was adopted by the *Chambre Syndicale*, and thus not only the members of the association, but also those of the Photographic Society of France, are enlisted in promoting the undertaking. As no opposition exists, we may be permitted to hope that recruits for our new Union will come in promptly and rapidly. So soon as the number of members is sufficiently large, it is evident that the Union will be able to exercise a much greater influence over the whole body of photographers than the association with its limited number of adherents would expect to do. My own wish is that the whole profession should take the place of a small clique; that we should be able to reply to the questions—"Who are you?" "How many are you?"—"We are the entire body of the photographic profession, and our name is legion." I have entered at some length into the details of this subject, because I believe that our example is a good one to initiate in other countries where photography is followed as a profession. Why cannot England do as much as France? Should such an organisation be established among our neighbours, we should very soon be able to arrange a grand international congress to meet in turn in all the principal cities of Europe. There can be no doubt, I think, that a congress of this kind would produce results most favourable to the progress and development of our marvellous art. Pardon my enthusiasm! I really believe in the possibility of my scheme. The cold may have put a stop to photographic work, but it has not quenched my ardour in the cause.

Photographic Retrospect of the Year.—The year which is now closing finishes well for us in France, but it has not produced anything very striking. To tell the truth, we have arrived at a stage when progress is not indicated by new discoveries and inventions; there is more to be effected in the application of old principles than in the search for new ones. Improvement of manipulative details should now rather be our study, for on it depends the present development of the photographic art. In this direction great success has been accomplished. Public instruction and courses of lectures have been established at the cost of the State, and cannot fail of spreading the knowledge of the different kinds of printing by the action of light. Of the novelties introduced into this country we have the platinum process of Mr. Willis. Artificial light has been applied to portrait photography by M. Liebert by means of the apparatus of Van der Weyde, and by M. Stebbing with the luxograph. We have also the process with gelatino-bromide emulsions, from which we may expect more than what we have already seen and known. Several of the meetings of the Photographic Society of France were in great part given up to the discussion of this negative process, which is distinguished no less for its rapidity, than (on account of its being worked with dry plates) for its convenience. Phototype and the carbon process have obtained a more assured position, but it would be rash to affirm that they have been greatly improved, or that their use has become much more extended. Photographers are very slow in diverging from the beaten track of the silver salts; but we must not be too impatient. The destinies of photography will be accomplished with that judicious dilatoriness which alone can render the structure sound and the work permanent. Our impatience arises from the fact that our imagination out-

strips the ordinary course of nature, and that we expect to see our dreams realised by magic. But such is not the common course of industrial or scientific work, rapid as may be its general progress. It must be confessed, however, that, up to the present, photography has not advanced slowly, but rather by leaps and bounds.

Prospects of the New Year.—Will the year into which we are on the point of entering bring with it any great discoveries? No one, I think, entertains a doubt on this point, so greatly are we accustomed to the marvellous when the question is that of photographic research. Nevertheless, without any desire to pose as a prophet, I must express my belief that for some time to come we shall have rather the development and improvement of present methods than the invention of new ones. More especially we may look for a great extension in the employment of photography. What in my opinion is a great desideratum is a method by which photographic prints can be introduced so as to be worked with type; this is an improvement which I strongly hope we may see realised during the year 1880. I will say nothing of a process for printing direct in natural colours, for this is a discovery the possibility of which I doubt as much as I believe in it. If it should be made, so much the better, and I shall be among the first to express my astonished satisfaction: if it be not made, I shall have nothing to regret, for photography as it is, and with all the applications of which it is capable, can already render so great services that we can fairly console ourselves even if it does not give us the direct reproduction of the natural colours. So much the better if it happens, so much the worse if it does not succeed; but we cannot afford to lose time in running after such fairy-like fancies, when more useful, though perhaps more prosaic, results await our researches.

I cannot prevail on myself to conclude without expressing to all my kind readers in the PHOTOGRAPHIC NEWS my best and most sincere wishes for a happy new year, and without requesting their indulgence for the continuation of my work during the coming year. The only new year's present I can make is the promise of neglecting nothing that may enable me to fulfil my duty, and that duty is to keep my readers informed as closely as possible of the progress and achievements of photography in France. In accomplishing my task I shall not fail either from carelessness or inaccuracy.

LEON VIDAL.

ON THE PREPARATION OF GELATINE EMULSION WITH GLYCERINE.

BY CAPTAIN ABNEY, R.E., F.R.S.*

IT is now more than six months since I described the preparation of gelatine emulsion without washing the emulsion itself, but by washing the silver salt, precipitated from an aqueous solution, and in the interval we have been favoured with various criticisms in the method, many describing it as—if I may call it so—a bogus method, and others writing of their success. To the first class, I would simply say it is somewhat ungenerous to imply that something was described which could not be carried into practice, and if there is anything which deters experimenters from giving the non-experimenters the benefit of their knowledge, it is the unhesitating way in which some of the latter class are ready to complain of non-success which is usually caused by want of skill and thought on their own part. A relation of my own was the inventor of glue moulds for taking casts, and he submitted a cast of a subject (and which was beyond the ordinary reach of a plastic mould) to the Society of Arts, and informed them that the cast was taken by means of a glue mould. The Society thanked him for the cast, but said the means of producing it he employed was *impossible*. A cast of a new subject and the glue mould used, after much debate, settled the point, and the gold medal of the Society was awarded him. The same spirit which existed then seems to exist yet. People seem to think that it is quite unnecessary to carry out minute directions when trying a formula—for instance, I know that many failures have occurred through dropping the silver into the soluble bromide, instead of *vice versa*, and I have no doubt that other failures have occurred through similar mistakes. It is seldom that an experimentalist furnishes an account of his failures—I don't—and it might be presumed that failures always do happen in any new set of experiments.

I have endeavoured still further to simplify the formula I have given, which perhaps will meet with greater favour in the hands of some, though probably we shall have accounts of failures.

I leave at present the question of the proper proportion of gelatine to the bromide, that is a point which I shall leave to the followers of Kennett, Bennett, &c., to settle. Suppose you want to emulsify 20 grains of zinc bromide, converting it fully into silver bromide. Take 30 grains of silver nitrate and dissolve it in 1 oz. of water, and add 1 drachm of pure glycerine to it, and mind that the mixture of glycerine with the water is perfect. Dissolve the zinc bromide, 20 grains, in 4 oz. of water, and add this drop by drop to the silver solution, *stirring well.* When all is added, the silver bromide will be found to be precipitated as a curdy mass at the bottom of the jar or vessel, with a slight milkiness of the supernatant fluid. This will subside in a short time, when the washing can be commenced as already directed in the Journal. Should there be an excess of silver, the first wash water should consist of 4 oz. of water, to which 2 drachms of nitric acid have been added. The silver salt should soak in this for a quarter of an hour. The washing must be continued till the wash water shows no sign of acidity: the silver bromide is then drained as close as possible, and turned into a bottle containing the requisite amount of gelatine dissolved in half the quantity of water it is intended to use. The bottle and its contents are then well shaken up and put in a saucepan of hot water, boiling if you like, and after five minutes the emulsion is shaken up till in a perfect froth. It is again put into the hot water and treated in the same manner after a lapse of another five minutes. Three of these shakings should perfectly incorporate the emulsion. An ordinary American egg-beater can be used to make the froth, with a saving in time.

Plates coated with emulsion thus prepared, without further cooking, are very rapid, and in a proper molecular condition. I am afraid to say how rapid they are for fear of being misunderstood.

Before concluding this short paper, I wish to refer to the addition of ammonia to the emulsion, as recommended by Dr. Van Monckhoven. Many are not aware that silver bromide absorbs ammonia (NH_3) rapidly, and with the same energy as exhibited by silver chloride, and the sensitiveness of this compound is by no means the same as that of the silver bromide "per se."

I have recently been trying bromo-chloride gelatine emulsion, as I believe others have also, and find that they are most satisfactory, and can be developed in light which would veil an ordinary bromide plate. They are very rapid, and take a good deal of intensity. They are orange by transmitted light, inclining to a grey tint. It seems to me that the addition of chloride or iodide will help photographers in making certain of producing unveiled plates. Some two years ago I tried gelatino-chloride alone, and I have repeated my experiments, and by means of ferrous oxalate have developed fair images on plates made with it. It is exquisitely sensitive, but the easy reduction of the chloride to the metallic state by any alkaline or iron developer renders it almost impossible at present to take advantage of it, except in a mixture of silver bromide. Mr. Berkeley, I believe, was the first successful worker in this direction.

* Presented to the Photographic Society of Great Britain.

For studio work, if you can obtain plates developable in a decent orange light, it seems to me that the present bromide plates will be out of the field. For out-door work of the ordinary kind, I still think that collodion emulsion carries the palm, and on another occasion I shall bring forward a collodion process which will press very hard on the heels of gelatine for rapidity.

PERSPECTIVE FOR PHOTOGRAPHIC STUDENTS.

BY JAMES MARTIN.

In continuation of the subject of tone, I have to add that tone is not always produced by painting in opaque colours, or indeed by the first application of colour at all, but by a second or even third painting of transparent colours over the first, each coat being allowed to dry before applying the next. This is called glazing, and produces a tint partaking of the upper and under stratum of colour. For shadows it gives that semi-obscurity called chiaroscuro; but it is certainly not to be recommended to depend too much upon this process, but to paint as near as possible to the effect desired with a good body of colour at the first painting, for transparent colours are apt to fade, varnishes and oils will lose their transparency, and become brown with age. Then, again, there is a great danger, when the picture is cleaned, of taking off not only the dirt and varnish, which should be removed, but also the glazing, and thus irrevocably spoiling it. Glazing is more especially adapted to painting in oil Great care should be taken not to use butuminous colours, as they shrink in drying, and after some time the surface of the picture will become covered with innumerable hair-like cracks. Lake prepared from cochineal should be avoided, as it fades very rapidly. There is no doubt that many fine pictures have thus become entirely changed as to their colouring, and others destroyed by rough usage in cleaning. Many artists make a practice to sketch in their design in what may be termed monochrome, generally styled dead colouring; but, for my own part, I believe that thus very frequently the spirit of the composition, and also of its design, is frequently injured, and sometimes altogether lost, and that so much working over and over again produces a tame and spiritless effect.

It should be specially remembered by the learner that his first painting, if performed in the aforesaid manner, must be composed of much weaker colours than those to be used in finishing, as it is impossible to paint a lighter over a darker colour without the latter reducing the brilliancy of the former. Although disapproving the practice of relying upon the effect of glazing to any great extent, still it is necessary it should be used on proper occasions, particularly in shadows, and also when any objects in the picture appear to come too forward and not keep their proper places.

Dead colouring is also required when it is intended to be covered with a thin body of colour, to which it gives an appearance of solidity which it would not otherwise have, and this dead colouring is frequently not at all the same as the colour painted over it. Thus a black garment is painted over red, and a furniture painter wishing to represent mahogany will first paint the article a cane colour as a ground or priming.

Correspondence.

INTENSIFYING GELATINE NEGATIVES.

Sir,—With all due deference to Mr. B. J. Edwards, whom I know personally, and several of whose ideas connected with photography I appreciate, I must certainly add my mite of information respecting the intensifying bromide gelatine negatives. The bichloride of mercury and the added iodide of potassium is not the invention of either Mr. Edwards or Mr. Jarman, but was first suggested by Mr. G. Croughton some time since, and has been used by me ever since. Wishing, when first I tried Wratten and Wainwright's plates, to get all the detail that was possible—my negatives were not sufficiently dense to give them sufficient printing power—I then had recourse to the iodide of potassium and bichloride of mercury mixed, but found the strength of the formula given by Mr. G. Croughton would not act satisfactorily for the gelatine dry plates. I increased the quantity of iodide of potassium, and found the result much better. The soda hypo-intensifier was found out by me by accident, through inadvertance of not washing the plate after taking it out of the hyposulphate of soda and immediately pouring on the bichloride intensifier, and was communicated by me to Messrs. Wratten and Wainwright soon after I adopted the use of their plates, quite six months since. I might also say that compound tincture of iodine will give greater density after the bichloride of mercury solution has been used. I think the soda mixed with the intensifying solution is not so good; it makes the negatives yellow. Increase the time of the printing, and eventually the negative becomes very hard and loses fine detail, for which this class of negative is so renowned.

My way of working is this: After the negative is developed and washed, pass it into a tray of alum and water—water a pint, lump alum one pennyworth. Let it rest there a few minutes—say five—then wash well and put it into a dish of rather weak hyposulphate of soda. If it be too strong it materially reduces the power of the picture. Now wash well, and place into a water-tight box or anything you have, and leave it some hours, and let the soda soak well out of the film. When it has to be intensified, wash again, and then pour on tincture of iodine—*not* compound tincture—(tincture of iodine one pennyworth), and dilute it with a little water. Flow this on the plate and let it rest a few minutes. Pour off, and then flood the plate with the bichloride intensifior, but do not pour it off for some seconds, or it will appear quite greasy, like a collodion plate does upon first being put into the bath. It will soon mix. Then pour on and off the bichloride intensifier till the required density is obtained. I do mine in front of a light frame covered with tissue paper, behind which is a gaslight, so that I always see my negatives with the same class of light, which is not, like daylight, continually changing according to time and seasons.

Wet collodion is done for now, I think, for ever. No more of it for me. What was once a severe trial is now a pleasure. We shall now, like the drapers, be able to ticket the goods —"St. Vitus's Dance taken, 1s. 11d.; Flashes of Lightning, 3¾d.; have your photo taken sitting outside the tram car as it passes the door, 3s. 6d.; warranted perfect." Instead of the photographic profession looking the gloomiest and most miserable of beings, they'll be called the jolliest fellows out. I was once a wet and ari'un (wet and hairy'un)—I wear a moustache—now I'm a dry old card, and yours, truly, James Syrus Tulley.

ENGLISH OR GERMAN PYROGALLIC ACID.

Dear Sir,—I note with pleasure the letter in your last issue on the question of English or German pyogallic acid. An analysis of a comparative nature as between the two has already been laid before me, agreeing in some particulars with that of Dr. Vogel's, but differing in others. Previous to communicating my views I took opportunity to ascertain the usage of skilled English workers, and I found they used, by preference, English pyrogallic, and had reason for doing so. When my article appeared I received a great number of communications, thanking me and stating that the writers had now found the cause of a want of power in their dry-plate negatives. In my own practice I find English pyrogallic preferable, and shall continue to use it. I can develop a larger number of negatives with a bottle of English than of German, and I find that opinion borne out by others; but this may be simply due either, as you have suggested, to a sample of German pyro weakened by use, or from some peculiarity in using it. I can scarcely be mistaken, for the German pyro was subsequently by accident again brought for use to our laboratory, when my operator found at once the old failure to get power. It was not until it was discovered to be the German pyro again that the cause was suspected. I would prefer to use German as being much cheaper. I may just add that the quantities I used were both in carefully weighed quantities, and in alcoholic solution of known strength. In repeated instances plates were cut in half, and one developed with each sample. I thought the results should be recorded, and I think so still.

I may add that I am aware *all* German pyro is not of this doubtful character, but the risk and loss from unexpectedly coming on such a sample leads me to select the English, in which such uncertainty is never found. SAMUEL FRY.

Proceedings of Societies.

Manchester Photographic Society.

The usual monthly meeting of this Society took place at the Memorial Hall on Thursday, the 11th inst., Mr. Alfred Brothers, F.R.A.S., Vice-President, in the chair.

After the minutes of the previous meeting were read and confirmed, Mr. J. C. Hattersley was duly elected a member of the Society.

Mr. John Scholfield then presented to the members a developing tray or box, made of metal and constructed to form a sink as well as a chemical chest, and a special vote of thanks was awarded to him for his very handsome present.

Mr. Parkinson (of Bolton), at the request of the Chairman, promised, if possible, to bring to the next meeting a print or enlargement from a negative he had succeeded in taking, by aid of the electric light, of a large group (the Choral Society of Bolton), and which had been noticed in the photographic journals.

Mr. George Gregory then read a paper on the subject of "Artistic Photography" (see page 5).

Mr. J. W. Leigh exhibited some very excellent photographs from 11in. by 9in. negatives, printed upon unglazed drawing paper; also the very handsome prize he had been awarded by the Amateur Photographic Association; and also a print from his prize negative.

Mr. John Pollitt explained that he had produced many prints on paper only slightly albumenised, which rendered them very effective for working upon afterwards; and, notwithstanding the result was similar to those exhibited by Mr. Leigh, they were printed in much less time.

Mr. W. Watts then read a paper, the subject being "Photo-Electro-Metallurgy." (see page 3). He afterwards conducted some very interesting experiments, projecting the same on the screen by means of the lime light sciopticon, and exhibited very beautiful specimens of electro depositions.

A vote of thanks was then given severally to Mr. Gregory, Mr. Watts, Mr. Leigh, and the Chairman, after which the meeting was adjourned.

Berlin Association for the Promotion of Photography

At the meeting of the 3rd October, Professor Vogel in the chair, were exhibited copies of the works to which prizes had been awarded by the Photographic Society of Vienna. They consisted of three prints taken from the same negative, one by the Woodburytype process, the second by the *Photogravure* process, taken by Goupil & Co., and the third a collotype by Messrs. Schober and Bachmann, of Carlsruhe. The three prints offer an excellent means of comparing the advantages of the different processes, and many of the members present looked forward to being able to form an opinion when the daylight should afford an opportunity of examining the works more closely.

Herr Joop submitted to the meeting a large photographic picture representing a performance in costume of an amateur opera company, and obtained by the skilful arrangement of a number of groups. There were eight of these groups in all taken in the course of a week, and then arranged, the whole being photographed with a six-inch Dallmeyer. The picture excited great admiration.

Herr Falk sent for exhibition a number of metal photographic frames in copper, brass, and galvanised zinc. Their flat borders are ornamented with a pattern obtained photographically, and then etched and blackened. The effect produced appears to be an excellent one, and the tasteful designs met with general approval. It was specially remarked that these frames would harmonize very well with the so-called old German furniture now so fashionable.

Mr. Wight showed some of the prints taken from the gelatine plates which he had referred to at the last meeting; these prints excited great interest.

Herr Prumm observed that the majority of the prints quite answered the expectation he had formed when examining the negatives; those in which the shadows showed no detail gave hard-looking prints. On the other hand, he was pleasantly surprised with the effect of those taken from plates which were rich in detail, but to all appearance weak and matt. It appeared to him that this process, excellent as it is for the service of the amateur, is not sufficiently certain to produce results that can compete with those of wet plates. In order to be able to form a more accurate opinion of the process, Herr Prumm desired to see a numerous collection of the works, not specially selected, of those English houses which adopt the gelatine process exclusively, and Mr. Wight promised to do his best to obtain them.

Dr. Vogel explained that the gelatine process had been rendered quite practicable for general use. Any faults that might occur were to be attributed rather to the operators who were wanting in experience, than to the process itself. When the wet process was first introduced many objections were raised, which greater experience showed to be futile. He pointed also to the very excellent results obtained by Obernetter.

Mr. Wight submitted some samples of durable silvered albumenised paper, which he had prepared two months ago, and which, so far as the gaslighting would permit an opinion to be formed, were pronounced to remain still quite white, with the exception of a few brown spots and brown edges. The latter defect the speaker attributed to the accident of citric acid having come in contact with the front side of the paper, though the Chairman was of opinion that it could not possibly have produced the effect.

Herr Joop, who, in accordance with the terms of an old formula, had added citric acid to his silver bath, found that the latter soon spoiled, and that the paper was very hard to dry, as well as required a large amount of gold in toning. The former speaker, however, explained that this defect could be avoided by applying the citric acid to the reverse side of the paper.

Herr Kunze complained of an evil from which he had long suffered. When the paper is silvered a number of small particles of albumen detach themselves from it, float on the bath, and stick to the next sheet that is immersed, giving rise to great difficulties. The same defect made its appearance whatever kind of paper was used, and with an old, just as much as with a freshly prepared silver bath. Diluting the bath and adding ether to it removed the defect, but only for a short time.

Herr Roloff had met with the same trouble, but only when a particular sort of paper was used, and Herr Reichard recommended rubbing down the paper with soft cotton-wool before silvering.

The President asked that a piece of the paper in question might be brought to the next meeting, in order that it might be experimented on. Several others members present complained of imperfection in the negative process.

Herren Haberlandt and Kunze had often found on the plates slight veiling like the spots in marble, and in the form of meandering lines.

Mr. Wight, Herr Quidde, and Herr Roloff thought the cause of the defect was to be found in the silver bath. The latter always found it necessary to evaporate a freshly-prepared bath, in order to make it work properly. Afterwards he often was compelled to insolate it and heat it with manganese.

Herr Reichard had also lately observed that a newly prepared bath generally gave a veil, which he could only avoid by evaporation, and boiling with glacial acetic acid; this, as a rule, produces a dense precipitate.

Dr. Vogel, though he had never had similar objections raised by his pupils when preparing silver baths in his laboratory, asked for specimens of the solution which gave such bad results, in order that he might examine them.

The next meeting was held on the 17th, October, Professor Vogel in the chair.

Herr Dietrich, of Dresden, sent the prospectus of his new manufactures in enamelled iron. The photographic dishes of enamelled sheet iron are strongly recommended as a substitute for porcelain, being equally durable and much cheaper. It seemed, however, to be the opinion of the meeting that it would be dangerous to use such dishes for the silver bath, also that there might be cause to fear the enamels splintering off.

Herr Seligmann, who had recently returned from a photographic tour in Switzerland, exhibited a series of views taken at various heights between 7,000 and 10,000 feet above the sea level. Unfortunately his work had been much hindered by bad

weather—mist, rain, and especially high wind. All the pictures were taken on Wratten and Wainwright's dry plates, but as the brilliant white of a snow surface, and the dark shadows of thick forests, often grouped themselves in the same view, much doubt had arisen as to the correct length of exposure. On this account he had not generally had recourse to the ferrous oxalate developer, which required an accurately determined time of exposure, but had more often used the alkaline pyrogallic developer, although the latter necessitated a longer exposure. With pyrogallic acid he had exposed for half the time required for a wet plate, and with ferrous oxlate from ⅓ to ¼ the time. Obernetter, to whom he had paid a flying visit *en passant*, also preferred the pyrogallic acid. For intensifying, he had found the following method to give very satisfactory results:—After fixing, the plate is laid for a few seconds in a weak solution of bichloride of mercury, and afterwards in water in which a little ammonia has been dissolved. The negative then assumes a black colour, not yellow, as is generally the case with the other formulæ for intensifying. In developing, Herr Seligmann recommended laying the plate for half a minute in water before transforring it to the developing pan. Ten or twelve seconds after the image began to make its appearance ought to be sufficient. He also observed that when gelatine plates were kept for any length of time before developing, they were apt to "go back," though not to the same extent as collodion plates; for that reason, then, immediate development is not possible, a longer exposure is advisable. For objectives he recommended Steinheil's aplanatic, and Ross's wide angle lenses. Herr Seligmann also stated that he had tried gelatine plates for taking portraits, and had obtained as good results as with wet plates in the same circumstances. He also showed some instantaneous views which he had taken at a local race meeting, and among them a picture of a horse taken at the exact moment when all four feet are off the ground. The pictures which he exhibited were much admired, more especially the portrait negatives, which, though they seemed thin, gave very vigorous prints. The opinion was generally expressed that better results could not be obtained with wet plates. Herr Seligmann added that the plates of Messrs. Wratten and Wainwright worked very well, particularly when developed with alkaline pyrogallic acid.

Dr. VOGEL stated that he usually employed Obernetter's developer, of which the following is the formula:—

Solution of potassium bromide	(1·10)	1 cub. centim.
Alcoholic solution of pyrogallic acid	(1·10)	2 cub. centim.
Ammonia		5 to 8 drops
Water		100 cub. centim.

As a rule, he prepared his own plates, and made his own emulsion. For the latter he takes one gram of German gelatine, and one gram of ammonium bromide, and dissolves them in 20 cub. centim. of water. To this is added by degrees 1·7 gram of silver salt dissolved in 10 grams of water. The solution is kept hot for twenty-four hours, then allowed to set, and afterwards washed in a continuous stream of water for from two to three hours. The jelly thus obtained is melted, and then flowed over the plates; 10 cub. centim. are sufficient for a plate 4½ by 7. Where great rapidity is required, he was in the habit of using Wratten and Wainwright's plates, which worked twenty times as quickly as wet plates. Obernetter's plates were not so rapid as this, but they gave more intense negatives.

Mr. WIGHT maintained that Wratten and Wainwright's plates would work in dull weather forty times as quick as wet plates, and Herr SELIGMANN remarked that the sensitiveness of dry plates did not decrease towards evening in anything like the degree of wet ones.

Dr. VOGEL held it to be not at all improbable that the same emulsion, which in a good light was from two to four times as rapid as a wet plate, might in a dull light be twenty or even forty times as rapid; the reason for this was not hard to find. Of the colours of the spectrum the ultra violet, the violet, and the indigo chiefly acted on the wet plates. At the line G in the indigo the sensitiveness of silver iodide ceased, or rather became suddenly very much smaller; on the other hand, the sensitiveness of the gelatine plate continued into the middle of the blue, and gradually decreased towards the red. Now, towards sunset the violet and indigo rays, which had the most energetic action on the wet plate, were the first to lose their intensity, while those which most strongly affected the gelatine plate—the blue rays—still preserved their energy; under such circumstances the greater sensitiveness of the gelatine plate was much more striking than under the effect of the violet rays in fuller sunlight.

Herr QUIDDE inquired how it came to pass that collodion emulsion containing only bromine salts behaved in quite an opposite manner, for that substance was most sensitive under a good light.

Dr. VOGEL replied that the properties of silver bromide were not yet properly understood. Five years ago Stas, a Belgium chemist, showed that there were six different forms of that salt, each of which had distinct properties under the influence of light. Silver bromide, in consequence of the difference of preparation, existed probably in a distinct form in the gelatine emulsion to that in which it appeared in the collodion emulsion; hence the different properties of the two emulsions could be easily explained.

The PRESIDENT also made some remarks on the late experiments with asphalt by Herr Kaysor, of Nürnberg, which, on account of that substance being used largely in photo-mechanical processes, were of great interest. It appears that alcohol will dissolve five per cent. of the asphalt, and other forty-five per cent. of the remainder, so that about fifty per cent. remains undissolved. This undissolved portion is that which is most sensitive to light, while the portion dissolved in the alcohol and ether is less sensitive. Hence we have a means of freeing the asphalt from its less sensitive constituents, and thus improving it for photographic purposes.

To Correspondents.

J. K.—If the albumen of your finished print sticks to the paper with which they are rubbed down when mounting, it has manifestly not been properly coagulated. The use of a weak printing bath or too short floating will conduce to such a result. If the albumen be imperfectly coagulated, the use of hot water will make the matter worse, as will also the use of washing soda in the toning bath. Besides, you will have more trouble and uncertainty in toning, and a toning bath which does not keep.

C. A. M. W.—We regret that we cannot answer your question with any degree of certainty. We have not, of course, made comparative trials of all. Of some, indeed, we have made no trial, whilst of others we have. We have seen very good results from the plates of Nos. 2, 4, and 7, and have most frequently heard good results on Nos. 2 and 7. The others are probably good, but we possess less information regarding them.

AMATEUR will be obliged to any of our correspondents who can inform him of the names and addresses of manufacturers of enamel tablets for ceramic photographs. The name of Robinson and Co. he already knows.

R. H.—The gelatine negatives you have seen have been an unfortunate example. If you had had the good fortune to visit the last exhibition, you would have seen many specimens of work from gelatine negatives, as well as many of the negatives themselves. The quality was in all respects and in every kind of work equal to the best wet collodion work; and the medal for the best picture was given to a print from a gelatine negative. As a rule, if the gelatine plate receives anything like fair treatment it yields a very harmonious negative. We shall be glad to receive the further communications to which you refer.

B. L. V.—More of the difference in tone—that is, in character of tone in prints—is due to the character of the negative than to the different formulæ of toning baths. A brilliant vigorous negative permits deep printing and a considerable reduction of silver in the shadows before the lights are buried, and the greater the reduction of silver, the richer the tone acquired in the gold bath. As a rule, a sample of paper which contains a small proportion of chloride as compared with the albumen gives warm tones. If a negative be dense enough to permit sun printing, that will yield warm tones, whilst printing in the shade will tend to cold grey tones. Some of the most pleasant warm chesnut-like tones we ever produced were obtained with a bath of sulphocyanide of potassium and gold.

R. F.—In very cold, dull weather, a warm iron developer may be used to shorten exposure, but it is a somewhat risky proceeding, as it easily causes fog. A 50-grain iron solution may be used safely, and, in that case, without any restraining, or, at least, very little (say ten drops) to an ounce of solution.

G. G.—Gelatine has been used for emulsions of chloride of silver very shortly after we introduced collodio-chloride of silver. Mr. Palmer showed us some very good results. A similar process was patented by a gentleman whose name we forget, but we think it was Smith.

YALNIP.—With skill and contrivance you will be able to do something with your appliances. In our next we shall be able to give you details, which time now forbids, as we very shortly go to press.

Several correspondents in our next.

The Photographic News, January 9, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

A Cheap Lithographic Process—Amateurs at Play and Amateurs in Earnest.

A Cheap Lithographic Process.—Mention has already been made in these columns of the new processes for copying letters and documents, that have recently attracted attention in commercial circles. A letter is written on ordinary paper, but with aniline dye instead of ink; the writing, as soon as dry, is treated as a transfer, and put face downwards upon a slab of gelatine compound. Most of the dye adheres to this gelatine, and by permitting sheet after sheet of paper to rest upon the gelatine for an instant, as many as thirty, forty, fifty, or even a hundred copies may be taken. Thus we have a cheap and efficient lithographic process. The printing is of the simplest, for it merely consists in laying down upon the cake sheet after sheet of paper, and pulling them up again; while the making of the transfer, as we have seen, involves no more than getting a bottle of Judson's dye (purple is best) and using it instead of the ink bottle. In a word, it is a collographic process, and as photographers are interested in the matter, and might, not improbably, be capable of making improvement in the process, we shall proceed to detail how the gelatine slab—which serves for printing block—is made. The proportions we have found to answer best are—

Glycerine	16	parts
Best Salisbury glue (Young & Co.)	4	,,
Sulphate of baryta	6	,,

Gelatine, it need hardly be said, will answer as well as glue; indeed, unless this be of the best kind, such as we specify, glue is unsuitable; but "best Salisbury" answers admirably. The *modus operandi* is as follows:—The glue is put into a pail of water to soak for twelve hours; in this way it will absorb sufficient water, and it will not disintegrate. as bad glue frequently does. The spongy mass is put into a utensil over a fire and dissolved, then the glycerine is put in, and finally the sulphate of baryta added. The baryta should be washed—it is in fine powder—before being stirred into the compound. The next thing is to filter. Photographers who have some knowledge of filtering gelatine solutions will know that this is no easy matter. The gelatine mixture must be kept warm, before the fire or in a water-bath, in order that the process may go on uninterruptedly. The filtering takes place through a horse-hair fabric or flannel. After filtering, the solution is again warmed up, and is then ready for filling into trays. These should be shallow, not more than three-quarters of an inch in height, and may be made of card, wood, or tin. Metal is preferable, as it stands more knocking about. These tins are warmed, so as not to chill the solution, and then the gelatine run into them. It may be filtered with advantage once more as it falls into the tray, a process, again, which is best conducted in a water bath, and must inevitably be done in a warm atmosphere to keep the gelatine fluid. Again, to prevent bubbles, the tray is put very close to the upper receptacle, so that the solution has very little distance to fall, for, as most of our readers know, air-bubbles are rapidly produced if the gelatine falls from a distance. The gelatine is allowed to cool; and then, to get rid of a few minute bubbles which may appear on the surface, a sponge or cloth dipped in warm water is rubbed over to wash them away. The result is a cake of gelatine sponge—maintained in that condition by the glycerine—which is always moist enough to absorb the aniline dye that is placed in contact with it. The writing, which, as we have said, is written with an ordinary pen on ordinary paper, is pressed not too firmly, but very closely, upon this soft gelatine, which, on the paper being stripped, retains most of the dye. The first prints that come off—the sheets of paper being merely pressed down by hand and lifted again—are usually very light, but they get darker afterwards. The ordinary Judson violet will give fifty to eighty copies without much difficulty, but it stands to reason that more dye cannot come off than has been put on, and if you use a weak dye, or one with but little body, the copies that come off will be few and faint. The violet seems to have more body than the other aniline colours. Photographers will find the proceeds very useful for rough lithographic purposes, but they must not expect such sharp and bright impressions as a stone gives which is inked at every copy, and subjected to great pressure. If the surface is too sticky, this defect may be obviated by washing with a weak alum solution. We have tried, indeed, immersing the gelatine cake in chrome-alum, the result being much sharper and darker copies; but then the surface became insoluble, and the dye refused to wash off, so that a portion of the gelatine had to be removed. Care should be taken to pull all copies required at once (say in half an hour), as the ink lines soon become broader and fainter. The transfer is rubbed off, as soon as done, with warm water and sponge (and elbow grease), and this is then ready again for further use.

Amateurs at Play and Amateurs in Earnest.—A complete photographic outfit is now included among objects suitable for presents, and we recently inspected a Christmas box of this nature. The affair cost, we were told, about £6 10s. in English money—for it was of French workmanship, or, at any rate, had been purchased in Paris—and was supposed to include all and everything necessary for the work of an amateur photographer. Stock was included in the purchase money contained in a series of bottles, some of which were large ones (those containing citric acid and kaolin especially), although this could not be said to be the case with that enclosing the nitrate of silver. The lens was a magnificent instrument to look at, but how it worked we are unable to say. The collection was altogether most comprehensive—too comprehensive, in fact—but it would be idle to deny that the articles, one and all, could not be used in photography. We often wonder, seeing the many pitfalls that waylay the amateur at the outset of his career, how it is he succeeds so frequently. The reason must be that if a lady or gentleman—for the number of lady amateurs has grown very large of late—seriously takes to photography, she or he at once searches the literature of the art, and is not slow to appreciate the practical remarks that week after week appear in the journals. Indeed, after a while your amateur becomes an enthusiastic experimentalist and pioneer in the art; but that is only after he has discarded the Christmas-box style of photographic apparatus, and has acquired sound and good paraphernalia either at first or second hand. He is an authority on sensitive plates, and will tell you at once that a Swan gelatine film requires to be intensified in a different manner to one of Wratten and Wainwright's. But he is not content, like his professional brethren, to purchase sensitive plates. They are so expensive, he says; you can make them for half the money. So he spends his spare hours cooped up in a close laboratory coating glass plates and preparing his gelatine compound. If you want a second-hand Dallmeyer, or a Grubb's landscape, the chances are that the hard-working amateur can put you in the way of getting what you want better than anybody else; or if you want a hint about packing plates, he is very likely to help you with a sound suggestion. The Christmas-box apparatus is rarely acquired by an aspirant himself, but is usually looked upon as something particularly appropriate for "giving away."

IRON PROCESS FOR TAKING POSITIVE PHOTOGRAPHIC PRINTS.

BY M. A. POITEVIN.*

It is well known that peroxides and salts corresponding to the higher oxides, when mixed with certain organic bodies, such as alloxanthin, tartaric and citric acids,

* Read before the Photographic Society of France.

and probably other analogous substances, are reduced by the action of light to protoxides and to salts corresponding to the lower oxides. For instance, ferric chloride (Fe_2Cl_6) mixed with tartaric acid and acted on by light, is changed to ferrous chloride (Fe_2Cl_4), a reaction that has been taken advantage of in the production of permanent prints by the powder process and in that of vitrified enamels. M. Pellet makes use of the same reaction for copying plans, &c., in blue lines on a white ground. A similar experiment may be made with corrosive sublimate (mercuric chloride, $HgCl_2$), which is reduced to the condition of calomel (mercurous chloride, $Hg_2 Cl_2$), and then blackens on being treated with ammonia. These different photo-chemical reactions may all form the foundation of photographic printing methods.

The process which I have the honour of introducing to the notice of the Society rests upon a similar reaction. Its object is to facilitate photographic printing by rendering unnecessary the use of a superior quality of paper and other costly materials, and, above all, by dispensing with the delicate operation of fixing by means of sodium hyposulphite; for the latter is substituted a few washings in rain-water.

In my experiments I use common scribbling paper, though I have no doubt that a finer quality would give better prints than those which I send to accompany this communication. I coat the paper with sesquioxide of iron rendered sensitive to light by a concentrated solution of tartaric—or, better, of citric—acid. This paper after being dried in the dark, and then exposed to the light beneath a negative, has the property of reducing a solution of silver nitrate, or of gold chloride, and of turning blue a solution of potassium ferrocyanide, in every part where the light has reduced the sesquioxide of iron to the lower oxide.

In order to obtain an even layer of the sesquioxide all over the paper, I brush the surface well over with a linen cloth dipped in a ten or twelve per cent. solution of ferric chloride, and then hang up the sheets to dry in a dark room. Next, I plunge these sheets one by one into a dish containing the liquid ammonia of commerce, so that each sheet is thoroughly wetted in succession. When a sufficient number of sheets have been immersed, I pour back into a special flask the ammonia solution, and then wash them several times in the same dish. I take them out separately, and hang them up to dry; this may be carried out even in full daylight, as the iron sesquioxide alone is not sensitive. The paper in this condition may be prepared beforehand; when I want to use it, I apply with a cloth, by the light of the operating room, a thirty to thirty-five per cent. solution of citric acid, and let it dry in the dark.

With a negative of ordinary intensity, the print is taken in the sun in a few minutes, and in the shade in about the same time as is required for silver chloride paper. After exposure, the image is not visible; to develop, the sheet is immersed in a one per cent. solution of silver nitrate, whereby it is not necessary to take extraordinary precautions against the penetration of light.

I have not found it requisite to take any particular standard for the salt. The bath can be used again as often as may be required by adding a little more silver nitrate; it does not grow turbid, but takes a light green colour, owing to the ferric nitrate that is formed in it. The image will soon make its appearance, and rapidly acquires intensity, so that in half-an-hour it will be fully developed. If the exposure has been long enough, the print will be of a dark sepia colour, but the tint will be of lighter, if the citric acid solution was too weak. The print can be intensified with great ease by means of a very dilute solution of either gold or platinum chloride, or, better, by both salts together.

By dipping the paper on which the impression has been taken into a weak bath of potassium ferrocyanide, a beautiful print in blue is obtained. A very dilute solution of chloride of gold will also develop the image of a violet colour, but one of platinum chloride produces no result. All the operations of this process can be carried on in the open daylight, except that of drying the paper that has been sensitized by citric acid; this must be done in the dark. The paper when prepared can be kept for any length of time until it is wanted, and there is no fixing by sodium hyposulphite required. So far as the photo-chemical reaction is concerned, I think the invention is complete; there remains now only the artistic question to be solved. That a solution will be soon discovered by our skilful photographers, I hope and believe. I invite them heartily to take it up and to study the process.

ART AND ITS RELATION TO PHOTOGRAPHY.

No. IV.

BY AN ART STUDENT.

In contrast to the solemn and vigorous style of Rembrandt, quoted in my last paper, may be taken Sir Joshua Reynolds, exemplified in his picture entitled, "Heads of Angels," also in the National Gallery, London. Softness, relief, roundness, exquisite grace of expression, are all combined in this most wonderful work of art, and the gradations are so delicately blended, the shade tints so faint and almost imperceptible, and the whole composition melts together with such tenderness, that as an example of how much can be done without depth of shadow it stands unequalled. Now these two pictures, although totally different in subject and treatment—the one representing a rugged, sombre, grim-visaged man; the other a group of innocent, guileless children, on whose features the world's stamp has not yet been set—are both, notwithstanding, based upon the self-same principle, and that principle is, simply, force of contrast.

How, then, is this obtained? If the shade tints in a picture be made very deep, the lights will naturally partake of more brillancy; thus, supposing we call the various gradations of lights and shadows—one, two, three, and four, four being the darkest tint—well, then, if, in a portrait, the value of the light equals three, and that of the shade two; by deepening the shade and lowering it to three, the value of the light will be raised to two merely by the opposition of a darker tint; and in the same manner the shadow is influenced according as the light is raised or lowered a scale.

But there are, as in musical harmony, different scales, though all subservient to the foregoing rules, and it must be borne in mind that before a picture is commenced, the artist will require to fix his key-note—viz., determine upon the force of his lights and shadows—and having done so, the whole composition is to be worked out and graduated on the scale chosen. If the highest light is put in of a brilliant ivory whiteness, to oppose it with tints of great depth would result in the light being heightened to such a degree that the one would have such an effect upon the other as to throw the entire picture out of harmony. Again, should the light partake of a dull yellow dingy hue, as in the "Capuchin Friar," it must necessarily be contrasted with shadows of great power to give it its due value. These remarks apply to all parts of a composition; but the head being the main difficulty, all the attention must centre on it first, and afterwards the principles will be found as applicable to the draperies and backgrounds as to the face. Thus, shadows may be made less heavy by introducing a curtain or any object of a darker hue, but great care must be maintained that these shadows do not face the light too vividly, always remembering that the face is the point to which the eye must wander at once; and this can only be accomplished by subduing all other lights on the picture. If a handkerchief, a collar, a hand, no matter what, is made of

the same brightness and value as the face, the vision is bound to become confused.

It seldom if ever happens that a form is met with possessed of equal grace and beauty in all its parts, but there is always something worth noting in the most ungainly figure—an eye, a nose, a smile, the hair, a foot, &c.—and it is by careful observation of these separate perfections that the artist is enabled to unite them in one model. The photographer has not this power to such a full extent, yet a great deal can be done to improve his powers by the aid of properly trained retouchers, and other means. I say properly trained retouchers, for it is the height of absurdity to expect a man to be able to pencil a head until he can draw one, or alter the shape of a nose until he has the knowledge of what constitutes an artistically-shaped nose. Indeed photographers, as well as retouchers, should take this to heart, for reasons needless to explain.

Accessories, while occasionally in portraiture indispensable, should always be looked upon as so much padding, the less of which the better; and when introduced must never obtrude itself, but be content to take the place assigned very humbly. A table, a chair, or a curtain can stand in a picture unobserved unless looked for, without disturbing the harmony, if only slightly relieved against the background? But make the background dark, and the accessory three or four shades lighter, and you will have it starting forth, challenging attention with the more prominent and important parts of the composition. This is one of the great faults in connection with photographs—the lights are either distributed promiscuously all over the picture, or the whole is wrapt in obscurity with the exception of the face, which stares out in a ghastly manner, devoid of gradations. A correct work of art must include neither of those extremes, but a mild adaptation of both. Thus, while the head holds its own, all other points should melt imperceptibly the one into the other by a descending scale of gradations, and present no sharpness of outline to interfere with the general effect.

Art licence does not consist in giving to an object a different form to what it possesses in nature, but art licence consists (and is entirely allowable) in altering the light and shade, modifying blemishes which might otherwise be painfully apparent, and changing (in landscape) the position of an object that would endanger the pictorial effect. There is a great difference between modifying and slurring: the one is the power of reducing anything to a subordinate position, retaining at the same time all the characteristics that belong to it; the other is a slovenly method, a sure sign of incompetency that cannot subdue without losing the individuality.

ON ACTINOMETERS,

BY LEON WARNERKE.*

Electro-chemical Actinometer of Edmond Becquerel.—This savant, knowing the law that every chemical action between two substances is accompanied by the generation of an electrical current, came to the conclusion that, since light produces chemical action, this action must also generate an electrical current—hence he saw a possibility of measuring the intensity of the action of light.

Becquerel used for his experiments a glass or earthenware vessel blackened inside, and having a very thin porous partition in the centre (Fig. 2). This vessel was filled with the liquid under investigation. In each compartment thus formed gold or platinum foil (previously heated to red heat) was placed, and connected with a multiplier, having 25,009 to 30,000 coils of wire. As soon as the half cover is removed, and the light strikes the surface of the foil, the galvanometer indicates the current by the deflexion of the needle. In the case of alkaline liquids, the exposed plate gives an indication of negative electricity; but in acid solutions it is positive. It is remarkable that in the case of pure gold or platinum no chemical action can take place. Various hypotheses were advanced to explain the cause of the deflexion of the needle in this case; but up to now no

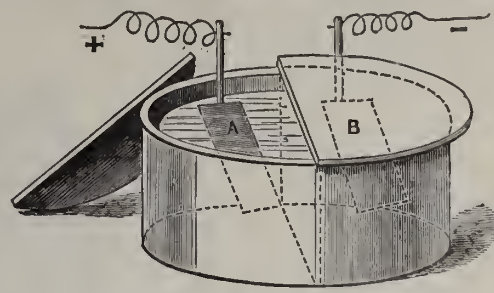

Fig. 2.

explanation can be considered as satisfactory. It was, however, unmistakably proved that it was not heat, but light, and only the more refrangible part of the solar spectrum, that produced the action indicated.

Subsequently, platinum foil was covered with thin layers of precipitated silver chloride; after which the plate so prepared was gently heated in the dark. By this means silver chloride is cemented to the platinum. When this plate is exposed to the light in the apparatus previously described, silver chloride begins to darken, losing part of its chlorine, and this chemical reaction is immediately indicated on the galvanometer. Following are the data obtained during M. Becquerel's experiments:—

White chloride of silver when exposed gave indication	...	7.5°
After $\frac{1}{4}$ of an hour, when colour became dark violet	...	5.5°
After $\frac{1}{2}$ of an hour, colour gray-black	...	4.5°
After $\frac{3}{4}$ of an hour ,,	...	4.°
After 1 hour ,,	...	3.°
After 2 hours ,,	...	2.°

M. Becquerel considered it sufficiently constant during a considerable space of time to apply it to test the comparative action of light on various salts of silver. And by this means it was found that bromide of silver is sooner decomposed, and gives rise to an electrical current of greater intensity than chloride of silver, in proportion as 15° to 26°.

In every experiment the intensity of the electrical current was variable, depending on the thickness of the sensitive compound. With bromide of silver, decrease of intensity is more irregular than with the chloride. Iodide of silver, not being blackened by light, gives rise to an electrical current almost as intense as that due to the chloride, but it is not so regular.

After many more experiments, M. Becquerel has definitely given to his actinometer the shape represented in the diagram (Fig. 3.) A glass rectangular vessel, A B, is enclosed in the blackened inside box, MM′, having the posterior vertical side provided with a micrometrical apparatus, by means of which a slide can be opened, admitting the light to the apparatus. Two metal plates, LL′, of pure silver, are suspended by the aid of brass pillars and arms, and are in connection with the galvanometer. The glass vessel is filled with acidulated water—to render it a good conductor of electricity—and the plates are covered galvanically with the sensitive substances—chloride, bromide, or iodide of silver. When the desired coating of haloid silver is obtained, the plates are heated to a temparature of from 150° to 200° C., till they become of a rosy tint. Plate L will prevent the light striking plate L′; but an opaque partition could be used. This actimometer is very delicate, and it is advisable to have only a very small opening in the side. The light of a candle at the distance of one decimeter produces a deviation of 12°

* Continued from page 5.

to 13°. Very important results were obtained by M. Becquerel, when this electro-chemical action on various salts of silver by the rays of different refrangibility was determined. It was found that maximum of action varies with the salt used. When iodide of silver was exposed to light previously, it gave two maxima and one minimum, as represented on the diagram (Fig. 4).

On the diagram the initial letters A, B, C are indicating the black lines of the spectrum. The curve *amH* represents the luminous intensity of the spectrum. *AnH*, the electric intensity with sub-chloride of silver. *AndzP*, the electric intensity of silver iodide, previously exposed to light. *FzP*, when iodide of silver was not previously exposed to light.

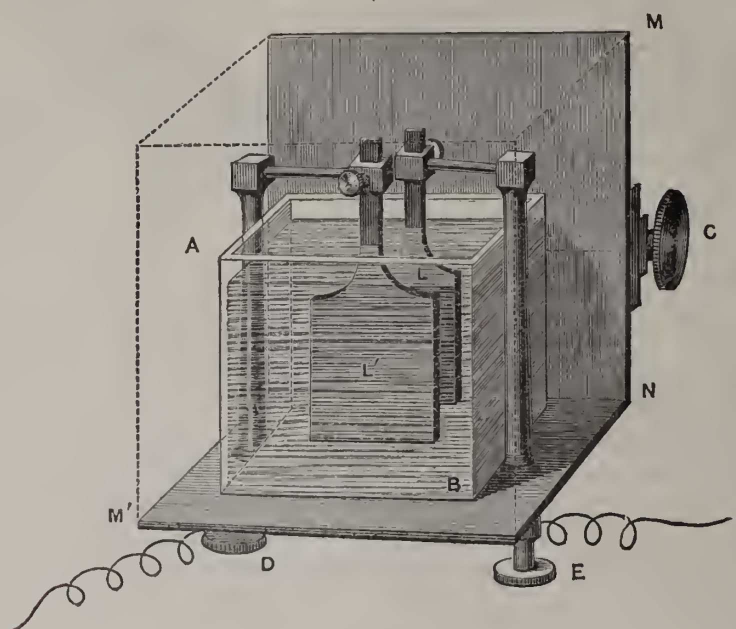

Fig. 3.

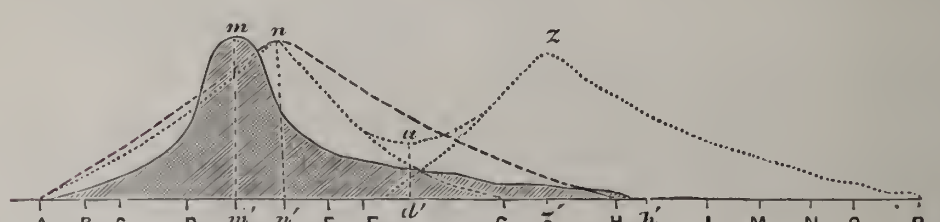

Fig. 4.

Recently, Mr. Lermantoff, from St. Petersburgh University, made an extensive series of interesting experiments with this actinometer; but the result of his very careful investigations, which testify to the correctness of M. Becquerel's results, does not add anything that can recommend this instrument for daily use in the photographic studio, since the manipulations with this instrument are too delicate. By examining the curves of the last diagram, it will be evident that the electric intensity under the action of rays of various refrangibility differs from the sensitiveness of the substances generally used in photography.

Bichloride of Mercury Photometer.—In the year 1815, M. Becquerel, and also M. Planché, studied the action of light on the mixture of bichloride of mercury and oxalate of ammonia (saturated solutions in equal proportions). This liquid is preserved without change in the dark, but exposed to light it becomes turbid with a development of carbonic acid. The precipitate formed was found to be protochloride of mercury. This reaction is chemically expressed thus:

$$2HgCl + NH^4O = Hg^2Cl + NH^4Cl + 2Co^2,$$

or bichloride of mercury + ammonia oxalate = protochloride of mercury + chloride of ammonia + carbonic acid.

The action of light can be estimated either by the quantity of the gas evolved, or by the quantity of precipitate formed. Edward Becquerel employed the last means, and to avoid the evolution of gas he improved the formula thus.

Water	100
Bichloride of mercury	6·5
Oxalic acid	12·5

In this case 2HgCl is partly decomposed. Protochloride of mercury is precipitated. The hydrochloric acid liberated forms, with hydrogen of the water, hydrochloric acid. Oxygen, acting on the oxalic acid, transforms it into carbonic acid.

Mr. Marchant introduced another alteration in the formula—

Water	100
Bichloride of mercury	6·5
Oxalic acid	15·8

The chemical formula will be—

$$2HgCl + C^2O^33HO = Hg^2Cl + 2CO^2 + HCl + 2H$$

This photometer has, however, a very great drawback in the fact that chemical action decreases steadily when it is in action, as can be seen in the following record of experiments:—Four identical apparatus were prepared, and the

first was exposed, from beginning to the end of the experiment, the others were subsequently introduced—

Hours of Exposure.	Photometers exposed all the time.	Photometers with fresh liquid.
From 10 to 11 ...	0·193 ...	0·566
From 11 to 12 ...	0·172 ...	0·763
From 1 to 2 ...	0·111 ...	0·723
From 2 to 4 ...	0 061 ...	0·554

Mr. Becquerel, comparing the sensitiveness of this photometer to the coloured rays, found that it corresponded with that of the chloride of silver.

(*To be continued.*)

ON TRUTH IN PHOTOGRAPHIC PORTRAITURE.

BY T. G. HEMERY.

It is a common-place remark, and one with which every photographer is familiar: "It must be like, because it is a photograph." Now I could show that in many ways it is a popular error, but for the sake of brevity (an article, rather than a chapter, being required) I will confine my present remarks to one single instance in which portraiture is not truthful, from a cause unsuspected, or not thought of, or, if if thought of, concealed by prudential reasons, for the revelation may dismay many, nay, even alter the whole system of enlarged portraiture, if some less erring method be offered for our use.

The first step to an enlarged portrait is certainly a transparency or positive of some sort, either by the camera, or by contact in the printing-frame. Until carbon came into general use, collodion had no rival, but the freedom from granular structure of a printed film of gelatine with its finely ground black locked up in the image—as against the "piled up deposit" of a silver developed positive—being recognised of such importance, carbon transparencies are now the rule, and collodion the exception. Suppose, however, that this is the first step of a fatal error, how then? What then? That it is so is as certain as that I am writing this article. I was led into the enquiry by the following circumstance. In the course of business, I had to furnish an enlargement (life size) of a deceased client. The picture being finished it was sent home, and I attended the usual committee of critical friends and relations. The verdict was soon given in my favour, when the widow was brought in for her opinion. She, too, shared the general opinion, only there was a *but*. The portrait was a profile, and the lady thought the *nose appeared too long*. Of course, I proved to demonstration that it could not be; that the process being a mechanical one, there could be no error; and so on, an assertion in which I was seconded by the invited critics, who, as usual, protested "it *must* be right because it is a photograph." But I have since discovered that it was not right, and that the widow remembered the length of her deceased husband's nose sufficiently well to detect an error of which I was perfectly unconscious, and which I would not admit on any terms whatever.

And the way this has come upon me is as follows:—I forget the reasons or the motives for the experiment, but it is sufficient to say that on some occasion I desired to make some transparencies on Warnerke's tissue, as well as carbon ditto from the same negatives. I then, for some purpose of experiment of a "Denier" character, which I have, as I said, forgotten, tried to superimpose the two images, the collodion film (Warnerke's tissue) upon the carbon one. To my astonishment I found they would not fit, and that in every instance the carbon image was in its total length about one-eighth inch increase, while the width remained the same. Here was a frightful state of things; in fact, imagine an eighth-of-an-inch enlarged to life size, the width remaining the same, and there is an end to our dream of photographic truth. But that the fact is so, you have only to superimpose a carbon transparency, developed on glass, back again on to the negative, and see if they will fit. But if you get the transparency on Warnerke's tissue, the fit is simply filling up the negative itself. The reason is simple enough, and perfectly easy of explanation. Before development the tissue is, as all know, plunged into water for the necessary swelling, and is then squeegeed on to a piece of glass; the supporting paper of course swells also, but always in one direction, and the development proceeding, the carbon dries on its rigid support as it has swelled, and does not go back again to its original form. There is no mistake about the error, and you have only to make an enlarged negative by both methods, and be considerably astonished at the result. There is no reason why Warnerke's tissue should not give as good a result as carbon, as it is not a "piled up" developed image, I should say a stain rather; and it has this advantage, that you can expose a dozen negatives on a single sheet, and develop them all at once; and as considerable latitude in exposure is permissible, five, ten, fifteen, or twenty seconds giving equally good results, being completely under control in development, and the rapidity with which you may obtain a few from the same negative (probably half a dozen) before the carbon had scarcely begun to print; it may claim many advantages besides that of truth, which is, however, a merit conspicuous in carbon by its absence. If I could ensure perfect contact between the plates, then I should say that gelatine would be the best of all, but neither negatives nor gelatine films are on patent plate, and failures from blurring must always be expected. In the nature of things we cannot be perfect in anything, but we are quick to discern the faults of others, and are blind to our own. We find out the errors we commit by a departure from the ordinary course, and though we may still not be in the right track, it is something to know, at anyrate, that we are trying to find it out.

MY FORMULÆ.

BY E. B. ROGERS.

When I leased the building I now occupy, I built my light twenty-four feet long, so as to work either end; north side six feet from floor to glass. The glass roof, seven feet long, angles 45°; it does not leak, though just ordinary sash, and the glass put in with putty. Many formulæ are good, and the most of them will give good results when properly worked.

Collodion.

Ether	10 ounces
Alcohol	10 ,,
Gun-cotton	80 grains
Iodide of ammonium	100 ,,
Bromide of potassium	60 ,,

Bath.

Water	12 ounces
Silver	1 ounce

Make up, and let stand in the dark until wanted. It will work much better to stand in the dark than in the light. When you begin to use it, just leave the plate in until coated. Of course a new bath coats quicker than an old one. Have plenty of it, and filter often. Never boil it or doctor it if you can help it; it won't give you but little trouble if you don't trouble it.

Developer.

Water	64 ounces
Iron	4 ,,

Let stand until dissolved and filtered: add acetic acid enough to make it work smooth; let your negative develop until it is intense enough, and wash well. Keep your bath clean, your developer clean, your dark-room clean, your hands clean for good pictures, and your face clean for appearance's sake.

* *Philadelphia Photographer.*

The Photographic News.

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TONING SILVER PRINTS.

MOST experienced silver printers can produce rich well-toned prints with tolerable certainty, but not so many probably can produce tones of any character at will. As a rule, a printer is master of a certain definite tone, probably purple or purple black. He works in a definite groove with definite formulæ, but if he were required to produce another character of tone, not every one, possibly not many, could vary the tone in any precise desired direction. We have received enquiries from several correspondents of late as to how to produce warm brown or chestnut tinted tones. A few hints on the general subject arising out of our experience may not be uninteresting.

In our experience, there is not a great difference caused in the character of the tone produced, no matter what alkaline salt is associated with the chloride of gold. The differences in the tints exhibited by gold in a state of sub-division are chiefly due to the degree of subdivision and the rapidity or slowness of deposition. Rapid deposit and coarse particles produce a black tone, whilst fine sub-division and separation produce a red tone. A sheet of gelatine before us, prepared from a solution of gelatine containing gold in suspension, is very thin at one edge, and runs thick to the other. At the thin edge, where the molecules of gold are fine and widely diffused, the sheet is of a beautiful ruby tint; whilst towards the thick edge it becomes a rich purple, purple black, and finally it presents the effect of yellow metallic gold. Silver prints which are rapidly toned, and receive a heavy deposit of gold, acquire an intense, sometimes an inky black, tone. Slow toning tends, on the other hand, to warmth.

But the colour of the toned print is a good deal influenced by the colour and character of the untoned silver image. Highly albumenized paper with a comparatively small proportion of chloride to albumen tends to give a red image in printing, with an equal tendency to retain a warm tint in the gold toning bath. An image printed on the albuminate of silver only, is of a red foxy tint, whilst that on chloride of silver is of a lavender tint. The first will yield warm browns, or warm purples, in the gold toning bath; sometimes a rich chestnut tint, and sometimes a chestnut black; whilst the chloride of silver image will acquire a tone of grey, greyish black, or neutral black in the gold toning bath.

The mode of printing will materially affect the tone. The tint assumed in sun printing is essentially different from that produced by printing in the shade. Sun printing produces warm tinted images, whilst shade printing produces grey cool tints. The reason for this is curious and interesting. Chloride of silver is much more sensitive than albuminate of silver. Hence in shade printing the chloride of silver chiefly is impressed, the albuminate of silver contributing but little to the formation of the image. Hence the cool grey tint of the image. To direct sunlight, albuminate of silver is very sensitive and is readily impressed, much more readily in proportion than the chloride of silver; hence the image formed, consisting chiefly of reduced albuminate of silver, is of a very warm tint.

If a little citric acid be added to the albumen solution for preparing the paper it tends to produce red prints, and a trace of citric acid added to the nitrate printing bath has a similar tendency. If the paper be fumed before printing, a rinse in water containing (say) six grains of citric acid to a pint of water will tend to give a red image. Whatever tone be required in the finished print, it is well to begin toning with a red image. The progress of toning can then be satisfactorily watched, and the tone acquired is more certainly due to gold, is more certain to retain its colour in the hyposulphite fixing bath, and more likely to produce a permanent print.

There is another element which materially affects the character of the tone in a point which is very much overlooked. The quality of the negative is a most important factor in the case. Without a really brilliant intense negative, it is difficult, if not impossible, to obtain fine tones. The negative need not be dense or hard—it may, indeed, be thin; but it must possess intensely good contrasts, which permit sufficiently deep printing to secure a good reduction of silver in the deep blacks. Gold toning being a substitution process, there must be a sufficient depth of silver to permit of a sufficient deposit of gold to give rich colour. It is not difficult, with a good deposit of silver, to secure a rich intense chetnut tint or a deep black. But a thin image from a weak, flat negative can only yield poor, weak, brown images, or feeble grey ones.

Of course the different toning baths affect the matter a little. The simplest form of toning bath is made with chloride of gold and carbonate of lime. It is especially handy for the amateur, as it can be made in any quantity as it is required. We keep chloride of gold in an alcoholic solution. A fifteen-grain tube of chloride of gold is placed in a two-ounce bottle with fifteen drachms of alcohol. One drachm of this, containing a grain of chloride, is poured upon about ten grains of pure carbonate of lime in a glass measure, and rubbed up with a glass rod into a creamy paste. From eight to ten ounces of hot water, about 130°, are then added, and the solution is ready for use when it cools. This, with a good print, will give almost every variety of tone.

The ordinary well-known acetate bath will also give good variety, generally tending, however, to warmth. For black tones the chloride of lime bath is often found best. It consists of

Chloride of gold	3 grains
Chloride of lime	2 ,,
Water	1 pint

A valuable toning bath, giving warm, rich tones, and especially well suited for collodio-chloride of silver prints on paper or opal, is the sulphocyanide bath. It is prepared as follows:—

Chloride of gold	1 grain
Sulphocyanide of ammonium	20 grains
Water	4 ounces

This bath may be used at once, or it will keep. The image first assumes a chesnut tint, and gradually deepens through a series of tints to a rich intense black of an engraving-like character.

We once saw some very fine prints of a sepia tint, quite removed from the ordinary colour of gold toning. The bath was made as follows;—

Fused acetate of soda	10 grammes
Borax	1 gramme
Chloride of gold	1 ,,
Water	1 quart

We hope the hints we have here given will meet the wants of several enquirers to whom we could scarcely devote sufficient space in the answers to correspondents.

FRENCH CORRESPONDENCE.

The Late Case of the Zulu Photographs in the City—Public Opinion in France on the Conduct of the Late Lord Mayor—Artistic *versus* Indecent Photographs—M. Stebbing and the South London Photographic Society.

The Zulu Photographs at the Mansion House.—The action of the late Lord Mayor, in causing Mr. Philpotts to be summoned to the Mansion House, under the pretence of suppressing the sale of indecent photographs, is not yet forgotten on the Continent; at this very time, in fact, it is still a subject of active discussion in certain circles. The extraordinary conduct of Sir Charles Whetham has met everywhere with severe reprehension, though perhaps, had it not been for the gravo nature of the principles involved, the incidents of the case—recalling the eccentricities of a magistrate in tho most lawless periods of the middle ages—might have been received with a smile. In truth, it is very difficult to maintain one's gravity, when reading how the first magistrate of the greatest city in the world found great difficulty in discovering the sex of the Zulus whose photographs were exhibited, which fact alone is enough to throw a doubt on the theory of the prosecution. It will in every way be better to treat the subject as one of those vagaries of human nature which every now and then crop up unexpectedly to the astonishment of all sober bystanders; and this, indeed, is the plan adopted by the writer of the leading article in the Photographic News of the 14th November last.

French Public Opinion on the Subject.—Nevertheless, there is, and always will be, a serious aspect of this question, no matter what may be the result of the present case. There is always a force of public opinion, which will ultimately have to be taken into consideration, and which, in the case of the prosecution at the Mansion House, was not, by any means, favourable to the conduct of your Lord Mayor. The less severe portion of the public, indeed, were inclined to consider the whole affair in the light of the swan's dirge of an expiring period of office. But the grave part of the business—the question of principle—still exists and will continue to remain. It is asked: Is an ordinary court of justice competent to form an opinion on morality in art? Do we not need a special and higher tribunal, not so largely imbued with prejudice, and not armed with the great powers that can be brought out from a complete arsenal of ancient and modern laws? A meeting of artists was held last week in Paris, in which this question was fully considered, and it was decided to use every effort to get some change effected in the law at present applying to such cases. It appears that the samo subject has often been discussed at other similar meetings both here and abroad, and many legal decisions were referred to, resembling in many respects the eccentric one of your late Lord Mayor. At the meeting of which I am writing, a general desire was expressed for a practical solution of the question, and tho most feasible seemed to be the establishment of a legally-appointed court of arbitration, consisting of artists and other competent persons, who should decide all those cases—nowadays sufficiently numerous—where prosecutions are undertaken against the vendor of works of art, on the plea that the objects he sells or exhibits are offensive to public morality. Ordinary cases should remain under the same jurisdiction as at present, for there are many such, where no excuse on the ground of artistic excellence can be raised, and they may well be left to be dealt with in the police-courts. As a matter of fact, art—the true art which every right-thinking man can admire—is never indecent; nudity alone never shocks the modesty of any one, otherwise the greater number of the works of art which now adorn our churches, our public gardens, and our museums, would have to be removed.

Artistic versus *Indecent Photographs.*—Unfortunately the ordinary run of police magistrates do not always hold this opinion. At the meeting abovo mentioned, several curious instances of this fact were related. It is always photography that is persecuted by our prudish magistrates in this search for immorality with a magnifying glass. Scarcely a month passes that the police do not make a raid on collections of prints which some agent has denounced as being obscene. The evil would not be a great one if these prints were really indecent, for no one could be too severe against any attempts to render immorality public and popular, but in the majority of cases they are not more so than the unfortunate Zulu photographs, which came under the animadversion of your late Lord Mayor; often they are indispensable to art students. Only very lately a dealer in photographs had his house invaded by the police, who made a seizure of a large number of photographic prints, which had been ordered fom Vienna by several artists, among which body he had numerous customers, and he was compelled to appear in court. Notwithstanding the testimony of many enimeut painters and sculptors, who swore that they used these prints for study, the poor dealer was condemned in a large fine, and his wares were all confiscated. It must be recollected that this was simply a collection of photographs of actresses in costumes more or less *decolletes*, certainly more decently attired than many an actress in the Paris theatres, with whom the police never interfere. What justice is there in this? As for the photographs, which artists call academical studies, because they are used as copies in drawing the anatomy of the limbs and muscles—just in the same way as living models who sit in the academies of drawing and painting—it is almost impossible to obtain them in France, in Belguim, or in Holland, on account of the strict police regulations. To get them, artists are compelled to purchase them through friends in Germany and Austria, and to have them smuggled across the frontier. These beautiful prints are produced with the greatest care, and without any kind of retouching, because of the special purpose for which they are to be used; but the majority of artists are obliged to do without them. They complain, therefore, with justice of the false modesty of the representatives of justice, who can so easily perceive the mote in the eye of another, while they overlook the beam in their own. It is really fortunate that this delicate question has attracted the notice of the artistic world, so that it will occupy the attention of men competent to deal with it.

M. Stebbing and the South London Photographic Society.—I may perhaps be permitted to say a few words on a purely personal question. I observe that M. Stebbing has thought fit in your contemporary to deny the truth of my remarks on the proposal which he made to the South London Photographic Society without his being authorised to do so. As I quite agree with him that truth is preferable to fiction, I willingly accept his reference to the *Moniteur de la Photographie* of the 16th November last, and to the *Bulletin de la Societe Francaise de Photographie*, No. 11. It will be only necessary to consult these journals to be couvinced of the truth of my statement. Apart from which I am not in the habit of making any such statement without grounds. I can easily understand that M. Stebbing wishes to make the best of a bad case, but that will not prevent me from reaffirming the perfect truth of what I said. It is certainly to be regretted that some obliging friend was compelled to draw M. Stebbing's attention to the French Correspondence of the Photographic News. A conscientious correspondent ought to read all the photographic journals, without distinction, if he wishes to be conversant with all the news that can have any interest for his readers. K. Vernaeyen.

AN AMATEUR ON GELATINE.

BY JOHN MATTHEWS.

Though only an amateur operator, I have dabbled in the art science with interest and zeal for a considerable time. Photography has always been to me a beautiful and absorbing

occupation, into which, in the summer months, I have thrown myself with energy and enthusiasm. Many are the little picturesque "bits" I have snatched from country lane and stream. Many a long row have I taken to get a particular view, which an inartistic friend has informed me as being worthy of my camera. Heated, tired, and encumbered with apparatus to which a "bagman's" samples were a comparative trifle, I have arrived to find the lovely view a grazing ground, three trees, and a windmill. However, I was the soft party for going. Those were hard-working days, those of the silver bath and collodion. They are now over with me. I heard of gelatine. I am no believer in processes. Several years ago I was recommended, as one of the great class of amateurs, by a leader in a contemporary, to try carbon. I did so; but, I am sorry to say, without success, though I tried hard. I have always looked upon new processes with suspicion, and I did not eagerly rush to gelatine. However, a skilful operator of my acquaintance tried some of the plates in his studio, and on his recommendation I ordered some from a prominent manufacturer for a trial. I will give my reasons for this course. Now if there is any one particular obstacle more than another in the path of a photographic amateur, it is his friends; they are quite distressing in their attentions; they invade him at all hours and in all weathers. Once it is known that you are "going in" for photography —if your apparatus is only a half-crown box— you are not allowed to find any charms in solitude. My aunt and uncle are about the most importunate of my sitters. My female relative, at some remote period of her existence, had a facsimile of her countenance done in chalk, and this she is never tired of urging me to emulate, and defying me to rival with photography. She says, "Eh, John! that is a very fair likeness; but *that* (the chalk one) is what *I* call a likeness. Photography is very well, but it can't come up to *that*." I endeavour to explain to the dear old soul that it would be astonishing if it could, considering that she is nearly forty years older since the standard one was finished. But she merely shakes her head, and sighs; which is equivalent to "You may talk yourself black in the face, but you can't convince *me*."

She and my respected uncle, from whom legacies are deferently looked forward to (not that I would have them depart the sooner for that: "long may they wave!") do their best to drive me to an untimely end. The more they are photographed, the more they think photography is improved. Their adherence to the art that cannot give them satisfaction is something supernatural. My aunt is considerably deaf, and at times the sufferings inflicted by the rack have been a mild sort of torture to what I have endured. "Now keep quite still," I have said. "Well, I'm sure," replies she, just as I remove the shutter, "I didn't think you could have done it so quick." She was under the impression I had said "quite finished." Mistakes like this occur all the time I am photographing her, and then she wonders I can't come up to the chalk one! My uncle never can reconcile himself to the head-rest; this unfortunate necessary and he never agree. It is always "Wait a minute, lad; this thing is shifty." Of course I have taken off the shutter! He suffers under the delusion, too, that the exposure can be stopped, shut off, and go on again at pleasure without injuring the plate.

Having troubled you with these details of what my friends are capable of—I have not mentioned male friends that bring their sweethearts, and all want to be taken in a group giggling—it is no wonder that when I read of the excessive quickness of gelatine plates, that it took small persuasion to get me to adopt them. Directly they arrived I began to try them. Burning with curiosity, I secured the imperfect youth that cleans boots and cutlery, and took him to my studio. It was nearly half-past three, and very dull. With a wet plate I should have given a minute-and-a-half. I gave ten seconds, which was quite enough, and (I believe through carefully and exactly following the directions enclosed) it came out the proper density. I was delighted, and should have carefully kept that negative, but, being young at the process, I endeavoured to dry it over the gas-stove, and so lost it. Since that time I have photographed my aunt and uncle to their entire satisfaction, which I look upon as no mean feat. I took them 10 by 8 size in four seconds. I have put aside my silver bath and collodion, and am deeply engaged in preparing plates myself, which, if the Editor think worth sending, I should have great pleasure in giving an account of.* That gelatine will eventually supersede silver and collodion I have not the slightest doubt; it is the process of the future, and, being an attentive reader of photographic literature, I find that nearly all the well-known writers are of the same opinion. The walls of the Exhibition, I prophesy, will bear this out in 1880. The ease, quickness, and the amount of work that can be done with it all help to make it one of the most popular of processes. Let but amateur photographers take it up, and professionals will soon follow. Amateurs always take the lead—they have more leisure than professionals—and it is left for them to experiment and find out the merits of a process; and I trust my brother amateurs won't neglect gelatine. Would-be witty writers may attempt to ridicule amateur operators, but amateurs are always to the front. Look at those tours we hear so much about from the various societies—in which the geography of the country plays such a prominent part—look how easily and pleasantly they can be undertaken now. Nearly all the operator's apparatus can be carried under his arm. No trouble of developing, no risk of silver bath being knocked over, or plates with films torn.

PHOTO-ENGRAVING PROCESS FOR SURFACE PRINTING.

BY HENRY KNIGHT.

Gelatine	1 dram (60 grs.)
Bichromate of ammonia sol. ...	3 drams
Water	9 ,,
Ammonia bichromate	1 dram
Distilled water	2 ounces

Bichromate of potash will answer equally as well as bichromate of ammonia.

Add the water and the bichromate solution to the gelatine, and when thoroughly swollen, melt over boiling water and strain through fine muslin. Two drams of the gelatine solution is sufficient for a $6\frac{1}{2}$ by $4\frac{3}{4}$ plate. Take a piece of patent plate glass (say a half-plate), warm it over gas or before the fire, and carefully level it with a spirit level. Then take two drams of the warm gelatine solution; pour upon the glass a little at each corner and in the middle, guide it over the glass with a glass stirring-rod, and dry at a temperature not exceeding 75°.

It must now be printed under a negative in direct light at the bottom of a box so as to exclude all vertical rays. The printing takes about half-an-hour in summer, and from two to three hours in winter in the sun. The printing must be carried out thoroughly, as success or failure entirely depends upon this part of the operation. The image must be well-defined upon the back of the glass; fine lines and stipple work must be as distinct and clear as the broader parts.

When printed it can be put into water at a temperature not higher than 80°, or lower than 60°, to swell. When all the undecomposed bichromate is washed out (which takes about fifteen minutes) it must be put into a solution of—

Protosulphate of iron	40 grains
Water	1 ounce

The temperature of this solution must be from 60° to 80°, and I find the common sulphate answer better than the pure sulphate. It must be occasionally moved about, and after being in about ten minutes, it can be taken out and washed with water under a tap for two or three

* We shall have pleasure in receiving the details from our correspondent.—ED.

minutes, and the superfluous water taken off with blotting paper. The iron solution hardens the gelatine film and prevents it sticking to the plaster.

A plaster mould can now be made as follows:—Take some fine plaster of Paris, and mix with water to the consistency of cream; put a frame upon the plate, then pour some of the plaster upon it, and stir it about with a camel-hair or badger-hair brush until it is very thick (the stirring prevents air-bubbles), then pour on the remainder of the plaster, and scrape off level with the top of the frame.

After the plaster is set, which takes about fifteen minutes, it can be separated from the glass plate. This gives the picture in relief the same as a wood block. Another mould in plaster must now be made from this.

The following plan I have found the best:—Take half a pound of soft soap, put it into three pints of clean water in any convenient vessel, which is set on a clear fire, and the solution kept in agitation by stirring. When the mixture begins to boil, add half an ounce of tallow, and keep boiling until it is reduced in bulk to two pints, when it is ready for use.

To prevent the two plasters from adhering, the surface of the plaster mould must be washed over with the above lacquer, allowing it to absorb as much as it can, when it assumes the appearance of polished marble. It is now prepared for moulding by laying a frame upon it, and a plaster mould made the same way as directed for making a plaster mould from the gelatine relief. When hard, which takes about fifteen minutes, they will readily separate.

A cast can now be taken in stereo. metal, which can be done at any stereotype foundry, and after cutting out the broader portions, it can be mounted upon a wood block, when it is ready for use to print in any ordinary printing press. If the above operations are carried out successfully, the stereotype cast should be as deep, and the edges as sharp, as any woodcut.

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."

Introduction.

1880! We are on the eve of it—I suppose by the time the reader sees this it will have dawned; but I write this on Christmas Eve, and my eye is dim and my heart is soft! My fire burns brightly, and my boy is full of joy, for he knows Santa Claus will be here ere morning. And I lay my head on my hand, and think. Think how thankful I should feel for all the comforts that surround me; and think likewise upon some Christmas Eves that were the reverse of this—when hunger and poverty stood on each side of my door—when my eye was hard and my heart felt cruel—when I felt as if I could use the great strength that God has given me as Samson did his, and at one swoop destroy my tormentors and myself. Yes, my heart is soft, and as I gaze in the firelight I think that others, perchance more deserving, more patient than I was in my poverty, are now in distress. I know those in our profession who are making money—hoarding money! I do not blame them, but let their hearts grow soft as mine this holiday time; let their better feelings guide them; let them drop a moiety in charity to their unfortunate brethren. However little, it will do some good—and, I daresay, will be thankfully acknowledged by Mr. Harland, secretary for the Benevolent Society. This introduction will look more like a begging letter than what I intended it for; still, those who have experienced what I described in my last papers of "Looking Back" will know I do it not only from a soft heart at this festive season, but from an experience that I shall carry with me to my grave.

And now about this set of papers. Seeing the success that attended my last attempt, I have been fond enough to imagine that the following prints will meet with the same favour. As in the last, I do not attempt teaching or displaying to you any wonderful discovery in our wonderful art; but, as I said in the introduction to "Looking Back," you may at times stumble upon some golden grain, amidst the chaff, that will repay all your trouble.

It is a queer title, and you will find that I have queer prints to show you. I have a batch of old negatives by me now. Here goes for the first one! I cannot help laughing when I look at it. It is one of the late Mr. Bennett, as Oliver Cromwell. Everyone who knew old George will know how *well* he "made up" for that character—he looked Old Noll to the very wart on his nose. An old lady of a religious turn of mind came to me one day and lifted up old George's picture.

"Aha!" quoth she, as she looked it over admiringly, "This is capital. It's Pontius Pilate! You have got the old beggar there—proper!"

I was thunderstruck; but long experience had taught me to keep my countenance, so that when I explained that it was meant for Oliver Cromwell, she clapped on her eye-glasses again, had another good look at it, and ejaculated: "Well, you know, I was sure I knew the face, anyhow!"

We will give my dear old friend's negative the title of No. 1, and proceed to

No. 2.—Ole Furr.

"Make us rather bear those ills we have
Than fly to others we know not of."—*Shakespeare.*

This is a poor negative. It is thin, foggy, and has a wintry appearance. It is a 4 by 5 plate; and the straight line with the point lace-pattern on one edge tells plainly that there was not solution enough in the bath, little as it was, to cover it. Yes, I took this negative in hard times—when I had that quiet little busines in Islington. At the first glance you would scarcely tell what it was: held upside down you might take it to be a landscape or a study of clouds; but held properly, and with tissue between you and the strong light, it will prove to you a quadruped. Still you might be at fault to know whether to name it an ass, a mule, or a horse, for it seems to partake of all three. Indeed, it is a very hang-dog animal, and a vile negative. Still, I think you will be surprised at the print that it will make.

Look at it once more, and you will see the figure of a little boy crouching in the hollow beneath its great hanging under-lip. He is tiny, as you see: one hand grasps the great knotty leg of the beast affectionately, and the other holds a book.

So much for the negative. Now for the print!

It was in December, close upon Christmas; it had been a week of fog, of hunger, and misery. A frost had set in, and once more enabled to view the customers that visited the shops on the opposite side of the way, and we had light enough to philosophise over the lack of customers to our individual shop.

Towards noon a heavy step sounded on the stairs, and I rushed from the *three* printing frames that I was lazily attending to, to meet on the stair a figure very common in London—a broad wide-awake hat, a dark grey waistcoat with sleeves; no collar at the neck, but in lieu thereof a glaring-coloured handkerchief tied in sailor's fashion. I was disappointed at first sight of him, for I thought he had come to try and sell me some greens.

"Good morning! Ye go out and take photographs?" Such was the question he put to me as he stood beating his leg with his whip. My answer was, of course, in the affirmative.

"Well, I want you to photograph Ole Furr," was his next ejaculation: then, seeing the puzzled look on my face, he added, "Ole Furr is a hoss!"

I made answer that I was quite willing to photograph his "hoss," but I was afraid of the success that might attend the operation: it was a hundred to one that "Ole

Furr," not understanding what was required of him, would move during the long exposure I required with my wet collodion—this being before the dry miracles of 1879 made their appearance.

"No fear of that, mister!" was his confident answer. "Ole Furr knows wot he is up to! He was in the Crimea, mister, before I got him! His life's like a story—it is! He'll stand the look of your machine, no fear!" and he cast a contemptuous look at my little camera. It was quite evident that he thought the lens had the same blood in it as the Martini rifles or the Woolwich Babies. "I'm a greengrocer," he added, as he gave a glance out of the window; "and that 'ere is my trap; I comes from Camden Passage, just down below here in the Essex Road. If you are on for the job, I'm ready to drive you down!"

It is needless to say that in less than five minutes I was in his spring cart on my way to Camden Passage. Every Londoner who is at all acquainted with Islington is sure to know Camden Passage. That queer narrow lane whose sacred precincts are never encroached upon by larger animals than the street dog or molrowing cat—that queer lane that picks you up on the Green and lands you at the Philharmonic—where you may go and buy anything almost, from a three-masted ship to a scavenger's broom! Just about half way through this funny place, Dinnear had his greengrocery store, and behind the shop, in a dark back-yard covered over with a slated roof, dwelt "Ole Furr."

As I said before, he was a hang-dog looking animal—quite Gothic—a very ruin! Still, would you believe me? Dinnear—a very type of a London greengrocer in strength and roughness—dropped a tear as he clapped the old wrinkled neck, and, as I said in the description of the negative, his little son clasped its great knotty knees affectionately.

I made the negative: it was over one minute's exposure, but the old beast was as still as if it had been dead, while the little boy remained as if his life depended on his stillness. When we first entered the queer stable the little boy was seated on a truss of straw reading a book.

"What, Jim!" cried his father; "reading that blamed potry again! Why can't ye go and help mother in the shop? I wish these poem chaps were at the devil!" he added, as he turned and addressed me. "That's wot these 'ere school boards and eddication is doing among us chaps—it learns the young uns all sorts o' notions, and makes 'em look down on their dads. Ah! know you do, Jim; but I can tell ye when I was your age, I was wheeling a barrow and making a nice living at costering."

"I can't help being lame, dad," whispered the boy, as he cuddled up close by his father's side.

"Bless the lad!" cried his rough parent. "Did I say you could? Give's a kiss, an' now run away to yer corner with yer book. Ah, mister!" he exclaimed, as he turned once more to me, "I hope you may never have a living monument of your folly like that before your eyes. Yes, it was my fault that he is lame, and that makes me so soft with him. I slaves from morn until night so I may lay by a little bit for him when I'm gone! That ole hoss has sommat to do with it, and perhaps when you come along with the picture I'll let you know all about it."

To be continued.

STRANGE USES FOR PHOTOGRAPHS.

The *New York Times* says; "Courts and lawyers are now putting photographs to novel uses. The sun-pictures of various kinds have been in popular use for a generation; but many years passed before they were adopted into the apparatus of courts of justice. The law of the land is a wary old fox, and scrutinizes a new invention for a long time before extending the paw to appropriate it. But of late years, when a person is to be identified, the judge and jury are very glad to look at his or her photograph as an aid. In such lawsuits as the great Tichborne trial, where a man claims to be a person who left the country years ago, and has not since been seen at home, if there are photographs of that person taken before he went, they may be of the greatest use in determining the identity of the claimant. Every one has heard of the rogues' galleries, in which the police keep photographs of noted criminals. If a thief or vagrant, newly arrested, is suspected to be an old offender, he is taken to the gallery and confronted with the portrait. A photograph is an important auxiliary in the still-hunt for a defaulter. If a bank cashier or insurance secretary has absconded with money enough in possession to warrant incurring the cost, the detectives will quickly circulate copies of his photograph. Experts can usually form some judgment of the course his journey will probably take, and $1,000 will put a cheap portrait and notice of reward offered in the hand of thousands of railway conductors and brakemen, hotel clerks, hall boys and porters, postmasters, baggage expressmen, news-vendors, keepers of saloons and restaurants, and all that multitude of alert, sharp-sighted, quick-witted men who have to do with travellers. No sooner does he settle down for a rest or a new home than the photographs, unsuspected by him, follow; and he can hardly buy a newspaper, a meal, or a drink, go in and out of his hotel, or call at the express or post-office, but someone is stealthily comparing the face of this stranger, now first seen in the town, with the visage upon the card. This gives the detective police of our day an aid of which the Bow street officers and the old-time policemen never dreamed.

The circumstance that the man to be identified is dead and buried does not hinder. Probably the well-known case of the murder of Goss, in Pennsylvania, would never have been unravelled if there had not been a photograph. There was a somewhat similar case, less familiar, of an Englishman who left wife and home in Canada to visit Alabama. He had not been there many weeks when he became involved in some controversy, was arrested by the sheriff, and was then taken from the jail by an angry mob and killed. His widow brought—as by the law of Alabama she might—a suit against the county for her loss of support. But her husband had been in Alabama for only a short time, and had gone by two names; hence, when the county authorities challenged her lawyer to make proof that the husband from Canada and the man killed by the mob were the same person, he was perplexed. The man, meantime, had been buried, and there was no person who had known him in Canada and Alabama both. Luckily for the widow, her husband had sent to her from Alabama his photograph, with his name upon it in his own handwriting. Upon the trial she produced the card and testified to the likeness and the autograph. The picture was then shown to the sheriff, and he said it was the portrait of the man whom he arrested and whom the mob took from him; and persons concerned in the burial declared it was the man who was killed. Thus the case was won.

A photograph of a building or of a locality may be very useful. Suppose a traveller along a country road by night drives against a heap of stones or pile of rubbish wrongfully left in the way, and is hurt. He desires to sue the town for damages, but of course the highway officers will send and remove the nuisance at once, and after that it will be difficult to make the jury understand whereabouts and how large the obstruction was. Let him have it photographed.

A New Yorker, when his next door neighbour, in altering his own building, tore down the wall between them, did not wish to let the mischief lie unrepaired until his lawsuit could be tried, so he had careful photographs taken. Then he repaired his place. When the suit for damages came for trial, his lawyer asked to show these pictures to the jury, and the Court said he might do so.

In Iowa a railway bridge broke down under a train, and the conductor was killed. His widow knew that the company would have the bridge mended long before she could have a trial, and that, after it was mended, there would be a great

difficulty in showing how defective it was. She had photographs taken of the wrecked bridge, and by aid of these she gained her suit.

In questions of hand-writing and the genuineness of signatures, photography has been several times invoked. As to this there is one peculiarity: a photographic copy can be taken enlarged, which increases, so the friends of such evidence claim, the means of detecting differences or asserting identity between two specimens. The effect is much the same, so one judge observed, as looking at a manuscript through a microscope, which has long been considered proper. But Courts have differed as to the propriety of using photography to determine the genuineness of papers where forgery is in question. The Taylor will case in New York, the Howland will case in Massachusetts, and the Rosa land-grant case in the Supreme Court, are notable instances of the discussion of this question. In a less known trial, where a bank teller denied that he had certified a check, and experts differed as to whether the certificate was forged, the judge allowed a photographer to come into the court-room with a lantern and throw a magnified picture from a photographic negative of the check upon the wall for the jury to see. Where the question is of preserving or using copies of undisputed papers, photographs are serviceable. In one instance a party asked the Court to send a document abroad for witnesses to see and swear to; and the judge said this might be done if applicant would first have it photographed, so that if it were lost the Court could use the copy. In another instance a party needed to produce some State papers from the War Department at Washington; but the officers would not allow him to bring them away, so he brought photographic copies, and the judge said they would answer every purpose. Perhaps the oddest case was one where the question was, which of two yeast powders of self-raising flours would make the best bread? Instead of bringing to the judge specimen buscuits to try, the lawyers had photographs, magnified, taken of sections of loaves; and they showed the judge these pictures.

Correspondence.

THE PLATINOTYPE PROCESS.

Sir,—In your review of the progress of photography during the past year, you make a few remarks bearing upon the platinotype process.

You state that an impression "seems to prevail that something of secresy is added, as well as a patent restriction, as a barrier to its use."

We desire to state that there is not the slightest foundation for this impression in point of fact. Perhaps you will allow us to explain in what relation we stand in regard to our licencees.

In the first place, as we are not ourselves producers of photographs commercially, but only of the material for their production, we have not the slightest interest in keeping to ourselves any details of working, but rather in making them known, which we are always glad to do to our licencees.

Be it understood, however, that we are referring only to those operations which have to be conducted by the photographer, and not to those previously performed by ourselves. To these latter, so far as their details are concerned, "something of secresy is added," since we are naturally enabled by constant experiment and practice to improve and modify our methods.

As to the "patent restriction," we do not understand in what manner this curtails the application of the process. If photographers were not under the necessity of applying to us for material, they would generally go to the dealers from whom they obtain their usual supply of chemicals—that is, if these latter thought it worth their while to turn their attention to the demand, which, at first, necessarily would be limited, seeing that there would be no monopoly, and these would not have the inducement we possess to make the process a success. Yet, so long as they supplied the material, they would require their usual profits on the sales effected.

The result would probably be, that photographers taking up the process would pay the same price for material of an inferior description. The cause of this would be want of knowledge and of sufficient inducement to persevere on the part of the manufacturers.

As for the annual fee paid for the right of using the process, this is so moderate that it could hardly be felt even by a photographer making only a limited use of the process.

But, to return to the subject which has provoked these remarks, we consider that the allusion to "secresy," if only hinted at, but remaining unnoticed by us, would be calculated to injure our reputation; for we should not regard any action by which (having sold the right to use a process) the vendor kept back any information necessary to the attainment of the best results with the material supplied as strictly honourable.

Probably the idea may have arisen in consequence of the extreme simplicity of the process, the instructions for the working of which some can hardly believe to include all that is necessary in order to attain to the best results hitherto found possible by yours faithfully,

The Platinotype Company.

[Our correspondents appear somewhat to misapprehend the bearing of our remarks. We never questioned the right of their patent or their secret, but simply expressed an opinion, in passing, that the impression on the public mind that some points in the process were preserved secret tended to repress the general adoption of the process. Our opinion might be erroneous; but it was based on observations we have frequently heard. Our correspondents cannot suppose that our remarks were made in any spirit of antagonism, as we have so frequently expressed our admiration of the elegance and simplicity of the process and the beauty of the results. Regarding the patent, we have not space to go fully into the subject here; but we may state our unhesitating conviction that the patent is a most legitimate and proper one, and that not only in the right and interest of the inventor, but that a patent in such a case is most beneficial to the public. It is always of importance to the public that the inventor of a process should have an interest in improving it and offering fair facilities for its careful practice. We must confess that we have doubts as to the policy and legitimacy of maintaining a secret about any part of the process; but that is scarcely a subject for discussion, but is one upon which the inventor has a right to exercise his own judgment. We quite agree, however, with our correspondents that licencees will best serve their ends by obtaining all the materials of the Company, who have not only special facilities, but special interest, in preparing the materials carefully and well, than by getting them in the open market. There are, however, always in photography enquiring minds and experimentalists, who, without any idea of piracy, like to prepare their materials themselves—who resent any barriers in the way of secrets at any stage of the process.—Ed.]

REVERSED ACTION OF LIGHT.

Dear Sir,—I this week commenced making transparencies on Swan's dry plates, previously making a fresh stock ferrous oxalate developer. The first plate I exposed to weak daylight, and on developing found it greatly fogged, but to my astonishment, a negative instead of a positive. The subsequent plates I exposed for eight to ten seconds to th light of a small paraffin lamp, and found them perfect. took eighteen in all, and, with the exception of the first one, they were all positives, and as, with the exception of the ex-

posure, the process was exactly similar in every case, I am quite at a loss to account for obtaining a negative from a negative. Perhaps you can kindly enlighten me, and oblige, yours faithfully, J. M. Nisbett.

[The case described by our correspondent is an illustration of the reverse action of light. Nearly twenty years ago M. Sabatier founded a process of producing transparencies direct in the camera upon this phenomenon. Working the wet process he partially developed with pyrogallic acid, then washed the plate, immersed again in nitrate solution, and exposed the plate to diffused light, and again developed, the result being a transparent positive instead of a negative. We have not before heard of a similar case with a dry plate as that described by our correspondent.—Ed]

Proceedings of Societies.

South London Photographic Society.

The first meeting for the Session 1880 was held on Jan. 1st, at the Society of Arts, Rev. F. F. Statham, President, in the chair.

The Chairman stated that the first meeting of the year had always been devoted to a lantern exhibition, and he hoped, from the number of slides, that the present meeting would be interesting, as well as amusing. The committee had decided that on these meetings the "minutes" should not be read, and therefore he begged to state that the proceedings would at once commence by the exhibition of some slides by Mr. F. York. These consisted of about fifty very interesting views in Belgium, excellent as transparencies, and admirably chosen as to the point of view. Mr. F. A. Bridge read an interesting description of the views.

Mr. B. J. Edwards next showed a series of views of New Zealand, which were very interesting as showing the foliage of the country, and it was a pity they were rather too much hurried through the lantern.

Mr. Frank Howard showed some charming little bits of English scenery.

Mr. Payne Jennings showed some slides from his negatives; but the transparencies certainly did not do his negatives justice.

The evening concluded by Mr. F. A. Bridge giving a reading, illustrated by slides, entitled "Raleigh's Queer Dream."

The Chairman then announced that the title for the picture for the monthly competition would be "Winter": pictures to be sent in on or before February 5th.

After the votes of thanks to the gentlemen who had shown slides, and to Messrs. Brooks and Bridge, who had so kindly supplied the lantern, the meeting adjourned.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday next, January 13th, at the Gallery, 5, Pall Mall, East, when Captain Abney, R.E., F.R.S., and Mr. Leon Warnerke will exhibit their new actinometers. Mr. Warnerke will also read a paper "On a New Actinometer."

Suicide with Cyanide.—The *Northern Echo* reports an inquest at Whitby upon the body of Mr. John Waller, proprietor of the West Cliff Photographic Saloon. He was found dead in his studio; and an examination of the contents of his stomach showed that he had taken a solution of cyanide of potassium. He had suffered from mental depression caused by heart disease.

Colour by Electric Light.—Professor Cohn, of Breslau, has been making experiments with the electric light on the eyes of a number of persons, for the purpose of ascertaining its influence on visual perceptions and colour sensations. He finds that letters, spots, and colours are perceived at a much greater distance through the medium of the electric light than by day or gaslight. The sensation of yellow is increased sixty-fold compared to daylight; red, six-fold; blue, two-fold. Eyes which can only with difficulty distinguish colours by the day or gaslight are much aided by the electric light.

To Correspondents.

S. A.—The term *eau de Javelle* is applied to a solution of hypochloride of soda.

W. Hicks.—We have no certain information as to how far New Zealand offers a desirable field for a photographic emigrant. It is probable that a first-class operator, well up in all the most recent processes, and so able to introduce the latest novelties, might be successful. If you think of going out there as a photographer, we should think it would be wise to take a good stock of all kinds of appliances. We cannot state which place offers the best chances.

W. G.—There can be no doubt of your right to control the publication of your own views, and the copying of them is doubtless piracy. We fear, however, that you have placed in peril your legal remedy by neglecting to register. The Copyright Act renders registration necessary. If you place all the facts before a good lawyer, and ask him to consider in connection with the provisions of the Act, he will advise you as to how far you have a remedy. In the meantime you may warn the pirates that they are infringing your copyright, and that you intend to protect yourself against such piracy.

Z. F. V.—You can doubtless obtain M. Vidal's work by ordering through a foreign bookseller, of whom there are several in London, such as Trubner, Dulau, Williams and Norgate, and others. Give any of them the full title and Paris publisher's name, and they will obtain the work for you. Our Publishers will order a copy if you wish. 2. The *Era Almanac* may be had through all booksellers, or at the office of the *Era*, which is, we believe, in Catherine Street, Strand. 3. We cannot give any definite information further than that we have already published. We have often found, in conducting similar experiments, that when a portion of a resinous body was soluble in alcohol, leaving another portion undissolved, that the latter could be dissolved by benzole, essential oils, bisulphide of carbon, chloroform, &c. It is a matter for experiment.

Milo.—There are various first-class photographers in London who are occasionally willing to give lessons in photography. Consult Mr. Blanchard, 289, Regent Street. 2. It is impossible to say whose are the most rapid plates in the market, as we have never heard of any comparative trials having been made. It is probable that those of the two firms you have named are about equal. We know they are both very good.

T. Garnalt.—It becomes very difficult to offer advice when you tell us that you follow to the letter operations which produce rapid plates, and as the result obtain only slow plates. If the operations were carried out with precision, they must produce the same results in your hands as in those of others. Like causes must produce like results. Sensitiveness is found to depend largely on length of time and temperature in emulsifying. Read Dr. Van Monckhoven's paper to gain an understanding of the principles. Our Year-Book, which will be out in a few days, will contain much information on the subject. The attacks to which you refer in other pages are, as you observe, very unworthy, but they are not worth notice.

A Ten Years' Subscriber sends us a somewhat extraordinary letter, containing, we are sure, well-meant hints. We quote some of his suggestions. He says:—"With the new year, I hope the News will be either reduced in price, or enlarged and illustrated, occasionally representing anything new; as it is now, it's one of the highest priced of papers, and the art of photography having made such immense strides this last few years, yet the leading journal remains in price the same (though the sale must have considerably increased) as when I first remember it." Our correspondent seems to think that as the art of photography has progressed our journal should decrease in price. He overlooks the important fact that the Photographic News was the pioneer of cheap literature in photography. To its enterprize photographers were indebted for early information of every advance in the art, being the first weekly journal issued in connection with photography, and there is not now in any other country a journal so cheap. We have given from time to time illustrations of almost every important novelty in the art. We published in connection with the News the earliest examples of photographic engraving, of carbon, of the Woodbury process, and of photo-collography. We believe we have in various ways materially aided progress in the art; but there is nothing whatever in the progress of the art which has tended to decrease the cost of journalism, but some things to increase it. We cannot promise, therefore, any reduction in the price of the News. We shall continue, as we have done in every available manner, to maintain its value to its readers; and we believe that the majority of our readers will be well content to receive their weekly twenty-four columns of information and interesting material at the really insignificant price of threepence.

D. C. L.—Sarony's photo-crayons were patented. 2. We are uncertain whether the patent has expired, or lapsed, but think it has. 3. The lithographed backs were supplied to licencees by Mr. Sarony, who had them produced for himself. We do not know of any other sources from which they could be obtained. It is possible that his firm would supply them, especially if it be the fact that the patent has lapsed.

J. T. Bainbridge.—Can you oblige our Printers with another copy of your illustrations, that supplied with the article having been lost by engraver.

The Photographic News, January 16, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHY AT THE TAY BRIDGE AND OTHER ENGINEERING WORKS—MEMORIAM CARDS—PHOTOGRAPHY AT THE STAFF COLLEGE, SANDHURST.

Photography at the Tay Bridge and other Engineering Works.—The Tay Bridge disaster, it seems, is to be considered by a committee of three experts, one of whom is Mr. Barlow, President of the Civil Engineers, while the others are the Chief Inspector of Railways and Mr. Rothery, the Commissioner of Wrecks. The fallen structure, as much of it as can be seen above water, has been carefully inspected by these gentlemen, but that a record of the existing state of things shall be at hand for the purpose of the inquiry, photographs have been ordered to be taken of the bridge in its present condition. The fractures, which will probably yield good evidence as to the nature and course of the accident, are to be depicted by the camera, and in connection with some of the broken girders, to be raised from the bottom of the channel, will demonstrate, no doubt, the story of the terrible catastrophe. The question whether the bridge fell first, and the train simply leaped headlong into the abyss, or whether the train left the rails by pressure of wind or excessive vibration, and cut the iron lattice-work on one side or the other, the violent shock then proving sufficient to bring about the fall of the whole structure, is one that will doubtless be capable of being determined by the ironwork as found after the accident. So that, before this is disturbed in any way, photographs must be secured, and these accurately placed in order for verification. The camera not only fulfils this very important duty, but it moreover permits the commission, after taking all local evidence, to move to a more convenient spot, say London or Edinburgh, to continue its deliberations. The inquiry is likely to last some weeks, if not months, and its members and other officials would be considerably inconvenienced if required to attend at Dundee for some considerable time. With the aid of photographs, however, it seems likely that no further visitation of the actual spot is necessary, and the inquiry will proceed as easily by the Thames as by the Tay, with the advantage that the services of scientific and technical witnesses are more easy to obtain in London than north of the Tweed. The suggestion to employ the camera in connection with the accident appears to have come from Mr. Barlow, and no wonder, for engineers make good use of photography nowadays. It is not so long ago that Messrs. Brassey, the well-known railway contractors, used the art in a singularly clever way to check the progress of a work. This was no other than the building of a railway line in South America; the work was given to a sub-contractor of respectability, and an engineer of the firm was sent to America to watch its progress. An arrangement was made to pay monthly, according as the embankment and bridging went on; but that the home authorities might have a check on their engineer as well, he was instructed to send home every month photographic records of the work for which payment was made, or, in other words, pictures of the railway line from time to time, showing the degree of progress. Landmarks and survey posts in the photographs permitted accurate measurement; and with a double check of a good engineer and photographic records, Messrs. Brassey were pretty sure the work was done for which they were asked to pay. It would be difficult to find a more simple means of controlling work at a distance of many thousand miles. Another example of the utility of photographing a railway structure was given the other day in the *New York Times*, as many of our readers must have seen. The widow of a railway official desired to bring an action against the company for the loss of her husband, who had been killed by the falling of a structure in Iowa. Necessarily the legal proceedings would take some time, and ere she could get her case decided before a tribunal the bridge would be built up again. So the widow at once decided to have the broken bridge as it was, with its defects and weaknesses, at once photographed, and this photograph, subsequently produced in Court, proved beyond a doubt that the accident was due to a fault in the structure. She gained her case, we are told, and there is little doubt that the conclusive proof afforded by the picture materially aided her towards this end.

Memoriam Cards.—It is strange that photographic portraits are not more frequently seen in connection with *In Memoriam* cards. Whether the portrait of a deceased person forms part of the card, or is annexed, matters little; but we think that the opportunity is peculiarly fitting for the distribution of a picture of a departed friend. Many put off the securing a portrait of the beloved one until too late; and even if a negative is available after death, it is frequently a matter of difficulty to secure an impression from it. But if a memoriam card were designed bearing a portrait of deceased—it must not be lugubriously set off, or mounted with a heavy margin of black—or better still, perhaps, if a portion of the card bore the portrait as a sort of attachment, the missive in question would be of considerable value to friends. The memoriam card, under the best of circumstances, is a grievous document to behold, but there would be more satisfaction, if but of a mournful character, if it brought with it a remembrance of the cherished dead one in the form of a suitably mounted portrait. Nor do we see why a deep black edging should generally be used in connection with these souvenirs; we usually think of a dead friend at his or her best, and dwell upon the bright side of the lost one's character. He was cheerful and amiable in life, a steadfast friend, and a delightful companion, and as such we would remember him; why, therefore, should this remembrance be always choked by a deep burden of woe? We shall never think of him again without a touch of melancholy and regret, but his bright and loving qualities will ever be before us. And while on the subject of photography in connection with such souvenirs, we would say a word touching the practice of placing portraits upon gravestones in cemeteries. During a visit to Kensal Green, some days ago, we saw repeatedly photographic portraits of the deceased placed upon the monuments over the graves. But in no single instance did we observe an enamel. There may be, and are, doubtless, several such pictures to be seen, but we simply say, that although several portraits came under our notice, they were all of the ordinary character. Silver prints, framed and glazed, they were in most cases; but sometimes it was a little frame under a glass shade. Pictures of this kind cannot last very long, let as much care as possible be taken, and it is singularly distressing to see in some cases the glass broken and the treasured relic perishing fast under the vicissitudes of wind and rain. There are a great many people who are quite unaware of the existence of enamel photographs, and there is little doubt that if the latter were more generally known, a demand for the charming productions would arise for monumental purposes.

Photography at the Staff College, Sandhurst.—Photography again figures very prominently as one of the subjects undertaken by those who study at the Staff College at Sandhurst. The Staff College, as our readers may remember, is for the purpose of instructing officers desirous of qualifying for staff appointments in the army. Under certain regulations, any young officer in the service may compete by examination to enter the college, and so, before they are entitled to serve on the staff, the students on quitting must pass a second examination. The subjects taught are such as are likely to be useful to officers

engaged in campaigning, and photography, which is one of them, seems to be a favourite occupation. Dr. Atkinson, who is Professor of Chemistry at Sandhurst, is instructor in photography as well, and it is to his efficient services that we owe so many practical photographers among the students of the Staff College.

FRENCH CORRESPONDENCE.

Mr. Warnerke's Researches in Actinometry—Accuracy of Actinometric Measurements for Photographic Purposes—Employment of the Actinometer in Taking Negatives—Meeting of the Photographic Society of France—Progress of the Gelatino-Bromide Process in France.

Mr. Warnerke's Reseaaches in Actinometry.—The very remarkable paper communicated to the Photographic Society of Great Britain by Mr. Warnerke derives much of its interest from the special attention that has been paid to the new actinometer for the studio invented by Dr. Van Monckhoven. Mr. Warnerke seems to have thoroughly studied this question of actinometry, and he has described with great exactness the different systems that have been pursued. In the conclusion that he arrives at, that there is no means of measuring with perfect accuracy the action of light on the different substances that it is capable of affecting, he is quite correct. The phenomena of the reactions are, in fact, very complex in their nature, for in addition to those due to the light itself, we have also to take account of those produced by heat and moisture. A properly-graduated thermometer is no doubt a perfectly reliable instrument, because the variatious observed in the thermometric column are not, and cannot be, the consequence of anything else than the dilatation or contraction of the mercury caused by the variations of the temperature. In every actinometer, on the contrary, we have to take account of a set of distinct conditions, and for this reason I asserted my opinion that the photometer of Dr. Van Mouckhoven could only be used with effect when accompanied by a table of corrections which it would be necessasy to apply in order to separate the action of light from that of heat. For a long time I have held the opinion that the simple actinometer, which rests on the principle of the coloration of a piece of sensitive paper, would be found to be the best, for the reason that with such an instrument observations can be obtained of a sufficiently approximate character to be employed in the generality of photographic operations.

Accuracy of the Instruments employed for Measuring the Actinic Influence of Light for Photographic Purposes.—Of course, in certain scientific researches on light, such as those to which M. Edmond Becquerel devotes himself, or those necessary in registering meteorological observations, it will always be found necessary to have actinometric instruments as rigorously accurate as they can be made; but it does not appear to me to be absolutely urgent that the same degree of exactitude should be required of an apparatus which has to serve as a guide in taking photographic prints. Not that the most rigid accuracy can ever be productive of harm—the best can never be injurious to the better—but we have to deal with conditions which up to a certain point are true, and true to an approximation generally sufficient for all practical purposes. If you consult any of the photographers who work at carbon printing, and who are accustomed to use one of those numerous photometers based on the comparison of the tint produced by the action of light on a piece of sensitive paper, with one or more standard colours, you will find that they obtain completely successful results, and that these photometers, inaccurate as they are from a scientific point of view, are yet capable of rendering all the service required of them. My own idea is (and I hope it will be noted) that we ought not to say that there is no necessity for producing anything better than now exists, for that would be to impose any limit on the progress of invention. Every photometer in any way better than those we now possess, I will welcome with great pleasure; but I hold that it is no less true to say that what we have now is generally sufficient for our wants in photography, than to say that there remains much to be done to render our present instruments perfect. Would that even such instruments as we possess, imperfect though they be—though, as I have said, they are thoroughly serviceable in the generality of cases—were used by a large number of photographers! But unfortunately the majority among us use no photometers at all, whether good or bad, and it may well be said that, though, on the one hand, photography is a science of formulæ, on the other, it is an art resting on chance.

Employment of the Actinometer in Photographic Operations.—How many photographers could be produced, whether among the first or the lowest rank, for skill and ability, who habitually have recourse to any kind of photometer for measuring the actinic condition of the light at the moment of exposure in the camera? For my own part, I confess, I know very few. More often it is among amateur, rather than among professional photographers, that we find those who make use of these toys (*amusettes*). Often I have had occasion to talk the matter over with photographers whom I was anxious to convert to a more exact method of working. It always appeared to me that, instead of relying on a determination—that is, what we call *a vue de nez*—it would be infinitely better for them to have some degree of certainty in their operations, by estimating with an instrument that can be read the action of the luminous rays, especially on dull days, and at times when the light is deprived of nearly all actinic power. For instance, is it not absolutely certain that if a piece of sensitive paper, in order to assume a tint of equal intensity with that of the standard of comparison, require ten times as long a time as it would require under a good light, it must have ten times as long an exposure in the camera to obtain the same effect as in bright sunshine. Why, then, is this method not resorted to—a method at once so simple and comparatively precise—a method by which so much trouble and loss of material, so many failures and discouragements could be avoided? It is because routine and hdbit are more powerful than the best advice. If at the time of Daguerre mention had been made of a photometer, and if at that period various authorities had pointed out the necessity of employing it in every case where the estimation of the action of light by the eye would be very difficult, no photographer would have thought of dispensing with an instrument by which the effect of light could be so easily measured. But photometers came too late; photographic tradition has become fixed, or, more properly speaking, operators have become accustomed to do without them, and now, whatever we may say or do, the habit cannot be broken through. This recalls to my recollection that a patent was at one time taken out in France by a Mr. Brice, I think, for an actinometer so arranged as to be adapted to the camera. I am not aware what sensitive substance he used, but no doubt it was the same as that on the plates, and it was necessary to find out the degree of actinic power by means of development. An actinometer of this kind is evidently only serviceable for indoor work. A long time ago I myself published a set of tables for calculating the length of exposure, accompanied by a photometer which was equally well adapted for indoors or out-of-doors. I may say, without vanity, that the edition which I published was very soon exhausted, and unfortunately, I was stupid enough not to publish a new one; this fault I am about to repair. Those who have read this work will know that the tables took into account not only the actinic intensity at any given moment, and the character

of the object to be reproduced, but also all the other conditions essential for every reproduction by the camera: that is to say (1), the focal distance, (2) the diameter of the stop, (3) the sensitiveness of the substance on which the impression is taken, (4) the average reflecting power of the object to be reproduced. This investigation was made some years ago, and I cannot help thinking that it would be now more than ever useful to call attention to it with the object it is proposed to attain. In reality, nothing is easier than to obtain good portable apparatus, excellent objectives, admirable changing boxes, and sensitive plates of wonderful rapidity. All these the amateur can *purchase*—developer, fixing liquid, intensifier he can provide himself with, and he will receive full instructions how to use them. Only one thing he will not be able to buy, and that is the *time of exposure;* on this point the dealers will limit themselves to calling their plates "*extra rapid*, so many times quicker than those of some other process." And then what happens? The amateur, with his complete equipment, starts on his expedition; his apparatus is everything that is charming; his plates are by the best makers; he has no doubt of being able to photograph all nature, and nothing equals his ardour, except, perhaps, his subsequent failure. As regards the time of exposure, what has he to go by? He sets to work at different times; he has been told to expose for five seconds, but the weather becomes cloudy. Judging *by the eye*, he thinks twice or thrice that time will be sufficient, when probably tenfold that length of exposure would scarcely produce a result. Several days of such confusion will soon disgust him with his beautiful apparatus and his admirable plates, and you will hear him everywhere, among all his friends and acquaintances, execrating photography as a most impracticable art. I have insisted at some length on this point because it seems to be one of the most important for the future of our art, and one to which we must give great attention if we wish photography to become an universal practice. The fortuitous nature of the length of exposure will always constitute a serious embarrassment, unless by some simple and practical means we can render amateurs independent of this inconvenience.

Meeting of the Photographic Society of France.—Kept at home by indisposition, I was unable to attend the meeting of the Photographic Society of France, which was held on the 9th instant. The agenda list contained only one communication of any interest, and I shall refer to it again in my next letter. It was a paper by M. Colas, on a ferrocyanide process which gives a picture in a black line on a blue ground. M. Colas thus becomes a rival of M. Pellet, whose prints in blue line on white ground have already obtained great success.

Progress of the Gelatino-Bromide Process in France.—France is certainly treading on the heels of England so far as regards the manufacture and the increasing appreciation of sensitive plates in gelatino-bromide. The impulse given to this subject by Van Monckhoven has produced a very remarkable movement. Only this process is talked of. All the dealers are hunting for pellicles and plates of gelatino-bromide emulsion, and the makers are emulating each other in lowering their prices to almost impossible limits. It seems almost fabulous that for six francs one can purchase a dozen plates thirteen by eighteen, glass included. I do not know whether the manufacturers can realize a profit at this price, but it is certain that this ardent emulation cannot but be a gain to the art of photography generally, for, as long as it lasts, one may cry, Heigh for gelatino-bromide —that is, if it does not soon become gelatino-iodide, which is quite within the bounds of possibility; wet collodion has had its day, or rather it will now only serve the turn in those cases where, in default of fresh bread, one is compelled to put up with stale.

LEON VIDAL.

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."*

Any photographic printer of experience would know instantly how to produce the best result from such a negative as "Ole Furr's," but, in case there are any who might be thankful for a simple wrinkle, I shall tell how I obtained a very respectable print. Slightly damping a piece of oiled paper—such as land surveyors and architects use for their tracings—I wet the edges with gum and applied it to the back of the picture. When dry I had a surface that I could work upon to any amount, either with a stump and black lead to soften the shadows, or with the pencil to brighten a high light or sharpen a line. Of course very judicious manipulation is required in applying either of the before-mentioned, but by care and patience I can assure you that a very inferior negative can be successfully treated in this manner. I am far from advocating the doctoring of negatives, yet, as we all know, there are exceptional cases when the photographer finds it impossible to get a better negative than what I obtained of the old horse—such as most likely will occur in the photographing of the aged and sick—I have thought fit to set this wrinkle down. When I had finished working up my negative in this fashion, I floated a piece of paper one minute and a half, instead of the usual three, on a fifty-grain bath; this, printed in the dull December light, produced me a print that astonished myself, and delighted the greengrocer.

"By Jove, mister!" he cried, as he held it at arm's-length, and looked at it admiringly, "I know what yer up to! I never thort it would be so mighty good. You come in an' show it to the missus! An' if you ain't too proud, have a bit o' cheese and a mug o' ale with us."

I wasn't too proud, so in a short time we were seated at a well-covered table, and, after listening to the praises of his red-faced better-half, I reminded him of his promise that he would tell me about old Furr and the little boy. His face darkened for a moment; then, brightening up, he exclaimed, "Ah, well! I suppose you would like to know how I comes to be so fond o' that ole hoss—blowed if I ain't fonder of him than my ole woman!—and I can tell ye, mister, ole Furr shall stand in that stable an' eat o' the best until the day he drops; an' when he does, there's no knacker will have him for cats and dogs; no, he shall have Christian burial in the backyard there; an' well he deserves it; for he has more of the Christian in his ole hide than some as I knows. Fill yer glass. Ye must know that I was a coster when I was young, an' used to go my rounds with the barrow. Sometimes it was hard to win the bread and cheese, but at others wur easier, and I used to lay by a trifle: for ye see I was crippled by the others as had hosses, an' I wished to get one. Well, one day my Sall an' I thought it would be better to join our savings together—this is get spliced, mister—then, ye see, by borrowin' a bit I could start a hoss and cart. I bought ole Furr at a milingtary sale for a mere song. Lor! worn't Sal an' I proud when we druv out Hampstead on the Sunday arternoon! Well, to make a long story short, things thruv with us so well arter I got ole Furr that I sold my round and went into the greengrocery. The grocery, as you see, paid splendid. Old Sall had about this time got little Jim, an' we wos all livin' in plenty, and all were happy—except me."

"What could ail you?" I asked.

"I'll tell ye," he continued. "Ole Furr, when I first got him, wasn't wot you would call a fustrater, although he was at the Crimea, an' wos slashed with swords, an' a hole through one of his ears with a bagnet! I had worked him well nigh ten years, an', as ye know, costerin' aint the easiest life for a hoss, so he got a bit lame and broken in the wind; an', instead of being the first in Covent Garden in the morning, he was the last; and my pals would chaff me so that—so that—in fact, *I was ashamed of the ole*

* Continued from page 29.

friend that had done so much for me! I aint the first as has done that same, mister, and I only hopes as sich will see their unnatural folly as I have done. But Pride is a proper hoss to go the pace when once she has the bit in her mouth, and her nose pointing down hill; all considerations are then thrown to the winds as she goes straight to the spot she points at. Thus it was with me! I was sorry to part wi' ole Furr, but, Lor' bless ye! when I see that high stepper I could resist no longer, so ole Furr was sold to a coster in Brixton, and down went the money for the high stepper. I paid over thirty sovs. for her, and felt myself a regular *toff* when I took her home.

"Then you were happy?" I remarked.

"Aye, until next Sunday, when I took Sall and little Jim out for a drive. I don't care about speaking much about that ere drive, mister! We was all too proud when we went tearing along the Essex Road. She went beautiful—like the wind; up the hill and through Newington Green—the wife a-smiling, and I a kind of intoxicated. Then we came to the green lanes with a fair road as far as Finsbury Park gates. I thought I'd jest see how she *could* go, an' tipped her with the whip. She sprang forward as if I had druv a knife into her. Ah, Mister! she bolted. They tried to stop her at the Manor House. Had they left us alone I believe to this day I would have taken the fire out of her; but that wasn't to be, Mister. She swayed to one side; I had no power over her She rushed at the gates, and smash we went! I wor bruised a bit about the head—the 'ole woman was shaken orful—an' little Jim had a leg smashed. The high stepper had cut itself so that I saw it killed within a quarter of an hour after the smash. You may guess my thoughts that night, when I sat nursing little Jim! Did I think of 'ole Furr—did I think how he wos *sure* if he wos *slow*; an' did I think how all I had wos mostly due to him? Ah! I did, Mister, an' more than I kin now tell ye. Enough that I set the whole misfortune down as a punishment for my ungrateful behaviour to 'ole Furr, an' I resolved then and there to sell an' pawn every valuable I had, so as to raise the blunt to get him back again. It wos hard lines to do it, for I only got as many shillings as I gave pounds for my high stepper; but I did it! The chap at Brixton wosn't hard on me, au' so I commenced my rounds again with 'ole Furr. Things have thruv again with me, for I have another hoss for heavy work now, so that Furr lives behind there like an old swell. He has been looking very dickie this last week, so I thought I should like him photographed—and well you have done the job, Mister."

Reader, there is a moral in this *print*, if you have art enough to find it out.

THE PLATINOTYPE PRINTING PROCESS.

BY JAMES YOUNG.*

Our subject to-night is the new method of producing photographic prints in metallic platinum. The process is known as the "platinotype printing process," and is patented by the inventor, Mr. W. Willis. It is now carried on commercially by a company at No. 2, St. Mildred's Terrace, Bromley Road, Lee, Kent. The company grant licences for working the process to professional and amateur photographers on very reasonable terms, reserving to themselves the right of supplying their licencees with the sensitive paper and necessary chemicals required for development. Mr. Willis, the discoverer of this beautiful process, tells us that platinum, whether in the mass or in the finest state of division, is perfectly unalterable by atmospheric influence, and that in a fine state of division it is the most intensely-black pigment we have in nature. These conditions are undoubtedly most commendable in the commodity we employ for the production of our beautiful and much prized works of art.

* Read before the Manchester Photographic Society.

It is not my intention to enter deeply into the philosophy of the process. Mr. Willis has done this so well in his different discourses, which are to be found in the pages of the Journal, that it would seem supererogation on my part to do so. It will, however, be necessary to say something about the chemicals employed in the process and their reactions to enable us to understand what is to follow.

Mr. Willis discovered some years ago that ferrous oxalate in a hot solution of potassic oxalate reduces platinum to the metallic state from its chlorides and other salts. This is the key-note of the process, and here I might state that all honour is due to Mr. Willis for having so skilfully worked out the process to such a successful issue.

And now for a few words about the chemicals used in the process. Let us take platinum first. The ordinary commercial article is of no use for producing platinum prints. It has to be purified as follows:—Ordinary commercial platinum is fused with metallic lead. As much of the lead as possible is removed with dilute nitric acid. The platinum powder now lies at the bottom of the vessel, mixed with a little lead and shining crystals of iridium, which is always present with crude platinum. *Aqua regia* is now used to dissolve the platinum and lead. The latter is thrown down by dilute sulphuric acid. The yellow double salt is now thrown down with chloride of ammonium and sodium, raised to 80° Centigrade, and left for a few days. The precipitate is now washed with solutions of chloride of ammonium, and then with dilute hydrochloric acid. If rhodium still remain, which is probable, it is removed by reducing the precipitate to spongy platinum by raising to dull redness in a platinum crucible, the precipitate being mixed with bisulphate of potash and a little bisulphate of ammonium. We now have platinum free from rhodium and other impurities; in fact, pure platinum.

The purified metal is now dissolved in nitro-muriatic acid, the nitric acid being displaced by evaporating with hydrochloric acid when dried. We have for residue the red or brown platinic chloride; formula, $Pt\ Cl_4$.

We now take a solution of this compound platinic salt and pass into it sulphurous acid gas until it ceases to give a precipitate with sal-ammoniac. The resulting grey powder—platinous chloride; formula, $Pt\ Cl_2$—is insoluble in water, but amply so in hydrochloric acid, a solution of which mixed with an aqueous solution of potassic chloride deposits a double salt in fine red prismatic crystals. This is the potassic-chloro-platinite—formula, $2K\ Cl\ Pt\ Cl_2$—that Mr. Willis uses in his process.

Next in importance stands ferric oxalate. How to make it:—Take pure iron and dissolve in hydrochloric acid, evaporate, and we obtain crystals of ferrous chloride. Now take these crystals of ferrous chloride and saturate them with chlorine, evaporate, and we obtain large red crystals of ferric chloride. Next make a solution of ferric chloride and of oxalate of ammonium or sodium, and mix. The precipitate is ferric oxalate, which has to be washed and dried. The last operation has to be conducted in the dark room, as ferric oxalate is remarkably sensitive to light. Mr. Willis says it is three times more so than chloride of silver. Ferrous oxalate is produced by the action of light on the ferric salt. The pale-orange ferric salt is changed by the actinic ray to the brown ferrous sub-salt, and the change enables us to judge of the right exposure required when printing under the negative.

After all these elaborate and intricate operations we come to the use of these purified chemicals by showing how to apply them to the paper:—

Take 130 grains of ferric oxalate in each ounce of water,
 30 ,, potassic chloro-platinite, and
 4 ,, plumbic chloride in each ounce of water.

These two solutions are mixed in equal quantities. Two drachms are taken and poured on the centre of a sheet of suitably-sized paper (which has been properly fastened to

a sheet of glass), the mixture is spread evenly over the paper by means of a glass rod wound round by a piece of flannel, and the paper is now hung up to dry. When surface dry it is finished before a dull fire or suitable stove. Here let me state the importance of keeping the papers perfectly dry. The company say, in their sheet of instructions, that most of the failures connected with the process are traceable to damp paper. I find, however, that when kept in a calcium tube it keeps perfectly good for at least twelve months. The paper being now quite dry is ready for the next operation, namely, printing under the negative. This can be done by inspection in the ordinary way, and is not more difficult than watching a silver print.

The reactions that take place in forming the picture may be briefly stated as follows:—The ferrous picture having been produced by exposing the sensitive ferric-coated paper under the negative to suitable light, it is amenable to the potassic oxalate developer. When heated to 170° or 180° Fahr. the ferrous picture is floated, face downwards, for two or three seconds. The developer instantly dissolves the ferrous salt forming the picture, and at the same instant the ferrous salt in solution with potassic oxalate attacks the platinous salt that lies in intimate connection, molecule for molecule with the ferrous salt, and reduces it (the platinous salt) to the metallic state, thus, according to Mr. Willis's discovery, that "ferrous oxalate in hot solution of potassic oxalate reduces platinum to the metallic state from its chlorides and other salts." These reactions take place so gently that not a particle of the platinous salt is displaced from the position occupied on the paper, but remains at rest, embedded and entangled in the matted fibres of the paper.

When Mr. Willis first produced prints by this process he found it necessary to use a wash of nitrate of silver to the paper before coating with the iron and platinum salts. The silver in some way assisted the developer to deposit the platinum salt in much finer division than when the wash of silver was omitted. This was the weak point in the process, and no doubt was the cause of so little notice having been taken of platinum printing; for there is a certain suspicion attached to silver and its handmaiden (hyposulphite of soda) that photographers somehow cannot get rid of—not that hypo would affect the platinum prints, but then there is the paper forming the high lights of the picture. Some judges say that hypo. has a tendency to degrade the high lights of a silver print. Now, if the paper forming the lights of a silver print can be injuriously affected by hypo. there is no probability of a platinum print being spared by it.

On the 20th of August, 1878, Mr. Willis was able to announce the prime fact that he had succeeded in eliminating all uncertainty from the process by merely adding a little platinum salt to the developer. The deposit forming the picture is as fine as when the silver is employed, and so the silver and soda with their baneful influence can be dispensed with. This was the keystone of success, and was the "flow that leads on to fortune;" and well Mr. Willis deserves both success and wealth for having, unaided, conjured up from the deep mysteries of chemistry this magnificent process.

And now, without further circumlocution, I shall proceed to the practical part of the business, and show how the development of the print is effected. Here is the developer—120 grains of oxalate of potash in each ounce of water, and seven-and-a-half grains of potassic chloro-platinite. This, when heated to about 18° Fahr., is ready to receive the ferrous print and transform it into the platinum picture. Here the ferrous print, which you can see in all its detail, though faintly, still sufficiently plain to enable you to do all sorts of double printing, adding skies, &c. We float it thus:—Face downwards on the hot developer for two or three seconds, when, presto! change! here is our permanent platinum proof—proof against the injurious action of any single acid or alkali, only chlorine [or aqua-regia being able to affect it.

The picture has now to be immersed for eight or ten minutes in the bath of oxalic acid to remove the unaltered metallic salts, after which it is washed in three or four changes of clean water to remove the acid; when dry it is finished.

I submit for your inspection a few finished prints. In judging of them you must take into account the simplicity of their production and their absolute permanency. You will, of course, mentally compare them with what you have been accustomed to, viz., the favourite brown and purple blacks of silver prints, but it has been shown that this is an educated taste arising out of necessity. You cannot get engraving blacks by silver printing, and so you have settled down to admire immensely what you could get, and very beautiful indeed are rich deep purple shades; but I for one have always longed for the engraving black, as one gentleman present (Mr. Brothers) can testify. Years ago I asked him to tell me how to produce the very shade that platinum now supplies. There is a probability, however, that all tastes as regards shades of colour will be satisfied. It is said that Mr. Willis has succeeded in producing warm brown shades of black by mixing iridium or other suitable metals with the platinum. If this be so, and the results equally stable, then shall we have nothing further to desire, and the process will be a finished one. I have no doubt in saying that the platinotype printing process will be the process of the future.

It will scarcely be necessary for me to state that to the pages of the Journal I am largely indebted for the information I have given you to-night. You are all such devout students of art literature that you will, ere this, have discovered the source whence my information has been derived. I have to thank our esteemed friend, Mr. Coote, for supplying the negatives used in producing the prints, and all of you for your kind attention.

PHOTOGRAPHIC COPYRIGHT.

BY A. BROTHERS.*

It will, I have no doubt, be remembered by all present that during the last few weeks there has been a correspondence in the newspapers, including the photographic journals, respecting photographic copyright. The discussion arose through the publication of certain portraits of ladies which it was said had been sold without authority, and it was supposed that if a proper law existed, the photographs could not have been offered for sale. It appears that it is intended to insert in a Copyright Act, which is to be introduced in Parliament shortly, clauses which will give *rights* to photographers which they do not at present legally possess; and, as I understand the matter, it is intended that the copyright in photographs—that is, prints from negatives—shall vest in the photographer.

Custom has for over twenty years given photographers the right to retain the possession of the negative, but until now I have never heard that any right could belong to the photographer in any print for the production of which he had been paid by the sitter. The inconvenience, not to say injustice, of this has been pointed out by Mr. Bassano and myself; but the correctness of our views has been called in question by the editor of the *Photographic News*, and, as his opinion may be shared by others, I have thought it a proper subject to bring before this Society, and in the event of what I think the correct view of the matter being adopted by the members of this Society, I think effective steps should be taken to oppose the clauses in the proposed Act of Parliament. For certain work we already have the means of securing our property by registration, and any interference in the way the business of photography is conducted would, I consider, be highly prejudicial.

As a proper introduction of the matter, I cannot do better than read the article I have referred to. The article will be found in the number for November 28th last.

* Read before the Manchester Photographic Society.

The Photographic News.

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PICTORIAL COMPETITION AT THE SOUTH LONDON SOCIETY.

In a recent reference to photographic societies we observed that enthusiasm and ambition, which are important elements of progress, were not wanting in the South London Photographic Society. A recent resolution of the Society will strikingly illustrate this position. On a motion of one of its members, Mr. E. Dunmore, the Society has resolved to institute a monthly pictorial competition, following out a plan not uncommon amongst young painters in sketching clubs.

In carrying out this project, a subject to be announced by the president at a preceding monthly meeting is to form the basis of the competition. Each member caring to compete must illustrate the subject after his own fashion, medals awaiting award to the successful competitors. The primary element of merit in such pictures is evidently intended to be pictorial excellence, rather than technical or other essentially photographic merits, as the jury of award is to consist of two artists, not photographers; and it is to be hoped that two capable artists will be found with sufficient leisure and sufficient interest in the matter to undertake the examination and decision month after month.

There can be no doubt that this project illustrates the existence of much enthusiasm and ambition, as it involves difficulties not at first sight apparent. The painter, to give pictorial embodiment to an idea, has a comparatively wide store of resources. Whatever his imagination can conceive, may be, without mechanical difficulties, placed upon his canvas. The subject may be an interior, or in the open air, land or water, animate or inanimate nature, day or night, with the whole range of colours to give effect to every phase of idea. The photographer, on the other hand, is confined to monochrome. He is, moreover, bound by innumerable limitations in the power of his art. He is either bound by the range of definition possessed by his lens, or driven to combination printing. And above all, he is bound by the necessity of placing before his camera the actual embodiment of his pictorial idea His conception must assume a concrete form capable of giving an image in the camera, otherwise his artistic conception is valueless. The first competition subject was announced by the esteemed president at the January meeting: "Winter" is pictorially indicated for competition at the February meeting. Here is a subject preeminently fitted for the painter's treatment. Take one of the most obvious, a snow-covered landscape with the frozen rivulet, a mill wheel with hanging icicles, and amid the gloomy landscape, with grey, half-thawed snow and a gloomy grey sky, a bright bit of colour, giving great pictorial value, is seen—the glowing forge of the village smithy. This scene, if it can be found in nature with suitable pictorial composition, must lose in photography that little bit of glowing colour which gives such a charm to the painting. A solitary cottage half buried in drifted snow, with the half-starved robin on the window sill, if rendered by photography, must be in cold monochrome, unrelieved by any touch of colour. A cosy interior, with bright fire and cheery company, the storm outside indicated by the snowy patches on the coat and hat of the just entered guest, may well suggest winter, but would not be of much service to the photographer. If he should be fortunate in finding subjects, winter is prolific in good effects, however, for the photographer. Few things are more beautiful than the newly snow-covered forest, or even garden. Or foliage after a frosty night preceded by a mist. The ice-bound stream and frozen mill-wheel. A worn-out nag, with drooping head, limp tail, and Gothic-looking, bony structure, which we recently saw standing hoof deep in snow in a field, was full of wintry suggestion. And photography is equal to various scenes of this kind, and we shall anticipate with pleasure the result sent in by the enthusiastic believers in the capacity of their art who project such a competition.

It is tolerably certain that whatever the results may be, the effort must be beneficial. No man ever gained high ends by low aims. As the president, quoting old Fuller, remarked—

> "Who aims the sky, shoots higher far
> Than he who means a tree."

To secure any chance of success the aspirant in these competitions must study something of the laws of pictorial composition, and study every example which may stimulate his invention and improve his style, and so acquire artistic modes of work which will soon be manifest in his ordinary productions. The experiment is a praiseworthy as well as a bold one, and we wish it every success.

BITS OF EXPERIENCE IN THE STUDIO.

BY GEORGE CROUGHTON.*

Swan's Plates.—One is almost afraid to write anything about gelatino-bromide plates; there has been so much written and said upon the subject that it is almost impossible to say anything new. But another year's experience with Swan's plates has thoroughly convinced me of their value. Many an unruly baby, frisky dog, &c., &c., has been caught that could not have been done with the ordinary bath plate; and many a portrait have I taken under circumstances where it would have been impossible to use a bath plate. I have heard objections that, in a good light, side by side with a wet bath plate, the gelatino-bromide plate will not give so good a result. That is scarcely fair. Place a new process in the hands of a man who has had many years' experience with the wet process, and expect the new process to produce results equal to it! This appears to me to be heavily handicapping the new process. The only fair plan would be to pit the two processes against each other—the best dry-plate worker against the wet—under the same conditions; even then the wet plate man must of necessity have had longer experience at his process than the dry-plate man. However, that troubles me very little. I have not discarded the bath, and as I look upon the dry plates as efficient assistants in cases where a bath plate would fail, I use them as such, and I feel confident, when all the conditions of their development become as thoroughly known as the wet process, results will be better with the dry than the wet.

I have had to modify my views since I wrote about them last year, and doubtless shall have to do so again; but the outcome of my experience is, that almost anything can be done with the development, and, in spite of many trials with other developers, I still think the alkaline pyro is the

* Intended for the YEAR-BOOK, but received too late.

best, and I have discarded all mixed solutions, and mix at the moment wanted according to subject, lighting, &c. As an instance of the power you can have over the development, I photographed the local rifle corps—some sixty men of all ranks. I exposed two Swan's 5 by 4, with the smallest stop, in a portrait lens: I say the smallest stop—it was a stop I made for the purpose, of cardboard, a thick knitting needle (red hot) being passed through the card to make the aperture. One plate was exposed as quickly as I could take off and put on the cap, say one second; then, thinking of the smallness of the aperture, I gave the next two seconds. No. 1 plate—one second's exposure—was developed first, with the ordinary developer, according to the formula sent with the plates: result—thin from over-exposure. If No. 1 was over-exposed with one second, what would No. 2 be with two? I discarded the developer I had used for No. 1, and made up at once an ounce, weak in ammonia, strong in bromide, and added two grains of pyro: the result is a beautiful negative—clear, soft, and not too dense. I have made 15 by 12 enlargements from it most successfully, and that is the great point—judgment in development. I do not know how little bromide can be used without inducing fog; but I know I have used very little indeed, and with strong ammonia. I have had to take children in a bad light—in fact, I have frequently taken children in such a light that, had I to trust to the wet process, I should have sent adults away, and have used as much as twenty drops of liq ammonia, ·880, to one ounce of water, and the smallest dose possible of bromide, with strong pyro, and got capital results without fog. And in that you have condensed the whole of my twelve months' experience with Swan's plates: full exposures—weak ammonia, strong bromide, less pyro; short exposures—strong ammonia, weak bromide, more pyro.

I have had very little experience this year with thin plates, almost all having developed up with sufficient density; but those I have had were easily intensified with the mixed bichloride of mercury and iodide of potassium. You must be careful not to overdo it, for the negatives dry more dense than they appear when wet; and, unlike collodion negatives intensified in the same manner, do not come down in varnishing.

OXALIC ACID AND ITS SALTS.

BY DR. J. SCHNAUSS.

Oxalic acid is found pretty abundantly in the juices of plants in combination with calcium and potassium, and in the latter case in the form of acid salt of potassium. The juice of *Rumex acetosa*, *Oxalis acetosella*, and other similar plants, all contain this substance.

This acid oxalate of patassium is soluble with difficulty in cold water, on account of the property it possesses of dissolving ferrous salts almost to as great an extent as oxalic acid itself; it is used for removing ink and iron-mould spots. Oxalic acid can be prepared from this salt, as also from sugar, by oxidising it with nitric acid. Of late years it has been obtained from sawdust, by heating that substance with sodium csrbonate in the form of hydrous acicular crystals ($C_2H_2O_2 + 2H_2O$). It can be easily deprived of its water of crystallization, and this anhydrous acid is said to be capable of sublimation undecomposed; but if the hydrate be heated quickly in closed vessels it decomposes into carbonic oxide, carbonic anhydride, and formic acid. Heated with concentrated sulphuric acid (H_2SO_4) it separates into equal parts of carbonic acid gas and carbonic oxide.

In photography oxalic acid is employed on account of its property of reducing the salts of the precious metals in the presence of light and heat, and also of readily dissolving the salts of iron, which are otherwise insoluble in water, even when in combination with a base. In the latter case the corresponding double salt is formed. The acid is often used as a reducing agent for the salts of silver; and it may be also so employed for those of gold, instead of the generally recommended iron sulphate. Recently oxalic acid, in combination with iron and potassium, has been employed for developing gelatine emulsion plates; it has been applied also to photometry, by Van Monckhoven, in combination with uranium, and by Eder in combination with mercury.

The uranium and mercury oxalates owe their employment for photometrical purposes to the fact that, when exposed to the sunlight, they are immediately decomposed, and give off carbonic acid gas, which, by means of a simple apparatus, can be made to raise a column of fluid in a small graduated tube. In this case, however, the pressure of the fluid column and the absorption of the gas must be taken into consideration, or eliminated.

Of the less known oxalates, perhaps the most interesting is the double oxalate of iron and manganese. It can be easily prepared by nearly saturating acid oxalate of ammonia (or the neutral salt, acidulated with free oxalic acid) with hydric peroxide of manganese ($MnO_2 + H_2O$); the operation must be effected in the dark. A solution of a splendid red colour is formed, which, brought into the clear light of day, almost instantaneously loses its colour with violent effervescence.

The hydric oxide of manganese required for this reaction may be prepared by precipitation from a solution of manganese sulphate ($MnSO_4$) by means of the so-called *Eau de Javelle*, a solution of sodium hypochlorite, ($NaClO$) rendered alkaline by the addition of a slight quantity of sodium hydroxide. This black precipitate is well washed on the filter or by decantation, and then dissolved in acid ammonium oxalate.

Very sensitive is a piece of filter paper dipped in a mixture of permaganate of potash ($KMnO_4$) and oxalic acid—of course prepared in the dark. When exposed to direct sunlight, decomposition ensues instantaneously; even in the dark the red colour is only permanent for a few minutes. If a solution of copper sulphate be mixed with one of ammonia-oxalate of iron, and a glass vessel full of the mixture be set in the sun, the side of the vessel which is towards the sun will be coated with metallic copper. This reduction does not take place in the dark. Nevertheless, it is a question whether it be due to the direct action of light on the oxalate of copper that is formed; probably ferro-oxalate is first formed, and this, by loss of oxygen, is converted into ferri-oxalate.

ON ACTINOMETERS,

BY LEON WARNERKE.*

Oxalate of Iron Actinometer.—This actinometer is based on the principle that ferric oxalate is transformed into ferrous oxalate by the action of light with evolution of carbonic acid gas.

It was Dr. Draper who first observed that solution of ferric oxalate in darkness remains for any length of time unaltered, but as soon as exposed to the action of sunshine, "actually hisses, through the escape of gas," which is carbonic acid, whilst a lemon yellow oxalate is precipitated.

This precipitate is the great drawback of these photometers, as the sides of the bottle become covered with it, and the light is thereby obstructed.

Dr. Draper mixed chloride of gold with ferric oxalate, and when exposed to light the ferrous oxalate formed, which caused the precipitation of metallic gold, which could be afterwards weighed. This system is expensive, long, and delicate.

Mr. Marchand altered the formula, proposing to use a mixture of ferric chloride and oxalic acid almost in equivalent proportions, but with a slight excess of the iron salt. The chemical reaction will be expressed thus:—

$$FeCl_2 + HO + C_2O_3 = ClFe + HCl + 2CO_2$$

* Continued from page 17.

This liquid is perfectly inert in the dark. It is not congealed even at a temperature of 8C.

This solution, before exposure to light, can be boiled without decomposition; but after it is once exposed, boiling may occasion what might be a dangerous explosion.

It is very important that the sensitive liquid should remain constantly clear, and this can be attained by strictly following the formula indicated.

Excess of oxalic acid is undesirable, because it helps the production of insoluble ferrous oxalate.

The solution must not be too concentrated, because its action is then not regular.

According to Mr. Marchand, the following solutions are prepared:—

(1.) Oxalic acid (96·5 per cent. of pure acid) 50 grammes
Water saturated with carbonic acid ... 1 litre

(2.) Ferric chloride at 20° B, saturated with carbonic acid.
In one litre bottle is introduced—

Solution No. 1...	20 c.c.
Solution No. 2...	10 c.c.
Water saturated with carbonic acid, or old solution	*quant. suf.*

This quantity of solution will act quite uniformly till 260 c.c. of gas is evolved; even then it is far from being exhausted.

For my part, I adopted the following formula—

Ferric chloride	60 grammes
Oxalic acid	16·5 „
Water	60 c.c.

I did not saturate it previously with carbonic acid, but began my observations after the apparatus had been exposed for some time to the action of light, and when consequently the mixture is self-saturated with carbonic acid. As to the amount of gas evolved, I followed the limits indicated by Mr. Marchand.*

The simplest apparatus for the measurement of actinic intensity of the light was first introduced by Niepce de St.

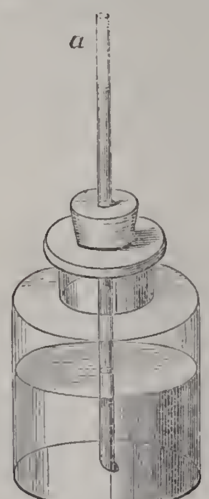


Fig. 5.

Victor (Fig.5). It is simply a bottle filled with sensitive liquid, and having the tube, *a*, passing through the cork, and almost reaching to the bottom of the bottle. The gas evolved by the action of light produces pressure on the surface of the liquid, and, consequently, causes the liquid to rise in the tube. But this simple form is not the best, for the following reason:—Carbonic acid produced by the action of light is very soluble in the aqueous solution forming the sensitive liquid; consequently, a large proportion of the gas which is to be used to register the action of light is dissolved in the liquid. This would not be so very objectionable if, after this liquid is once saturated, the gas would remain so permanently; but this is not the case. This solubility is widely different at different temperatures —different in the dark and in the light: different at various barometrical pressures. It follows from this that when the newly prepared liquid is exposed to light, it does not register the action of light immediately, because a very considerable quantity of gas must be first manufactured for the saturation of the liquid. This is the first error.

To be continued.

* Etude sur la force chimique de la lumière de soleil.

Correspondence.

THE PLATINOTYPE PROCESS.

Sir,—I have not read the specification of the Platinotype Company's Patent, but I gather from their letter in this week's News that the formula or process by which they prepare their paper is secret.

Now, "the object of the specification is (under the protection of the Letters Patent), to put the public in full possession of the inventor's secret, so that any person may be in a condition to avail himself of it when the period of exclusive privilege has expired."

If necessary descriptions are omitted, or the methods described are not the best known to the patentee, the specification is bad, and the patent is void, but may be amended.—Yours truly, Verb. Sap.

Sir,—In reference to your remarks appended to our letter published in the Photographic News of last week, and in view of an apparent misapprehension of our statement there made, will you kindly allow us to state that the "secrets" referred to are connected solely with proportions and modes of application? In every respect the process is the same as that described in the Patent.

Thus it will be seen that a knowledge of these details would be of little use to the "enquiring mind" debarred by patent rights from turning them to account. No doubt every manufacturing company has "secrets" of this kind, even where there are no protecting patents.

We are much obliged to you for all your remarks upon the subject, for otherwise we might have remained un aware of an impression prevailing with some of your correspondents.—We are, sir, yours faithfully,

The Platinotype Company.

REVERSED ACTION OF LIGHT.

Sir,—It may interest your readers to know that Mr. Nesbitt is not alone in his experience of this phenomenon. Some two months ago a precisely similar thing occurred to me on two occasions. If I remember rightly, one plate was a Wratten and Wainwright, and the other a Kingston-Bennett. Both showed signs of considerable over-exposure, and the image was very feeble, but still a negative. I should say that in each case the exposure was made to daylight.—Yours faithfully, W. H. Hutton.

SIZE FOR DISTEMPER BACKGROUNDS.

Dear Sir,—Noticing in the News inquiries from numerous persons for proportions of glue for distempering, I find to mix the colours with well-boiled flour paste, rather thicker than paperhangers use, is preferable to glue; it works smoother, and the edges do not dry so rapidly.

Amateur.

PHOTO-CRAYON PORTRAITS.

Dear Sir,—Your correspondent D. C. L., in last week's Photographic News, will probably be glad to know that the Photo-Crayon Portrait was provisionally patented by the late Mr. Sarony, and at that time we (as

his agents) supplied a large number of the lithographed backs to licencees only. Since the patent has lapsed, the sale of those lithographed designs has been free and open. We have them in stock in several tints and designs, and we shall be happy to supply them to him at 12s. per dozen nett, if he will communicate with us.—We are, dear sir, faithfully yours, D. H. Cussons & Co.

Proceedings of Societies.

Photographic Society of Great Britain.

This Society held its usual monthly meeting on Tuesday last, at its rooms, Pall Mall East, James Glaisher, Esq., President, in the chair.

Messrs. Murray and Heaviside having been appointed auditors of accounts, the President called upon Mr. Warnerke to exhibit his new actinometer.

Mr. Warnerke then read a paper descriptive of his instrument, the principle of which was the registration of light absorbed by sulphide of calcium, which was thereby rendered phosphorescent. In the actinometer showed, a disc of sulphide of calcium was enclosed in a brass cylinder, and light introduced on a portion through a small aperture. The aperture was then held to the eye, and by a mechanical arrangement, successive layers of gelatine, the varying thicknesses containing each a number, could be passed over the illuminated spot, and the actinism thus estimated.

The room having been darkened, Mr. Warnerke, with the aid of magnesium light, showed the use of the actinometer very successfully, and also demonstrated it. By placing a layer of green coloured gelatine over the phosphorescent calcium, and again exposing to light, the phosphorescence could be removed, and the calcium made ready for another registration.

Mr. Werge inquired how many times the calcium would bear re-illuminating before its power of phosphorescence was exhausted.

Mr. Warnerke said that if protected from atmospheric influence, moisture, and excessive heat, it would bear illuminating indefinitely; if, however, the calcium be exposed to a high temperature, the luminosity was increased, but its persistency lessened.

Mr. S. Fry thought that Mr. Warnerke's actinometer really solved a problem which had occupied the attention of scientific men for a long time. He believed there was in it the germ of what photographers had long wanted—a perfect actinometer.

Mr. Warnerke observed that he had omitted to mention one fact in connection with the use of sulphide of calcium, and that was, it was sufficiently sensitive to register the light emitted by a candle or by gas.

Mr. Pearsall, while admitting the importance of Mr. Warnerke's invention, hoped that his confidence in the durability of the illuminating material for an indefinite period would be fortified by future experience. He did not quite understand whether the actinometer gave the same results in a feeble light as in a very powerful light. Was Mr. Warnerke confident on the statements he had made on this point? He should also be glad to know whether the sensitiveness of the sulphide of calcium was affected at all by temperature—that is, would it give the same effect at a low temperature as at a high one? He had made some experiments with phosphorescence, and he had found that in passing electricity over a phosphorescent substance, the light varied according to the number of sparks and their intensity. For instance, the light given in one case was green, but if the number of sparks was increased, the light was not necessarily green, but might be yellow, red, or approaching white; but of course with light other than electricity the results might be different. He should, however, be glad to know if Mr. Warnerke had made any experiment with high and low temperature.

Mr. Warnerke said that his own experience had been of so short a duration, that he could not of his own knowledge answer Mr. Pearsall's question respecting the duration of time during which the power of luminosity could be retained. He had, however, gone to the best authority on the subject, M. Becquerel, who stated that the substances could be kept for a long period without showing any difference. M. Becquerel mentioned an instance where a piece of Canton phosphorus had been kept for fifty years, and still retained its phosphorescent quality. With regard to temperature, there was no doubt that a high temperature, such as 500 Centigrade, did affect the retaining power, but this was not a temperature to which any photometer would be likely to be exposed. In such a case as this, the observation of M. Becquerel was, that the high temperature lessened persistency.

Mr. Sebastian Davis wished to know whether the actinometer could register a light so short as that produced by the discharge of a Leyden jar. He asked the question because he had made an experiment some time ago, by discharging an electric spark upon a rapidly revolving disc divided into sections of different colours, the effect being that the whole of the colours became visible, as though the disc had stopped.

Mr. W. Atkinson wished to know whether in using the actinometer it would be necessary to give a longer exposure on a dull day than on a bright one.

Mr. Cadett thought there would be some difficulty in judging precisely of the registration of light on the calcium, owing to the fact that, coming from a strong light, the retina of the eye was affected, the variations of course depending upon the person. Speaking for himself, he found that after looking at a bright object, the eye retained the sensation for some little time, and this, he thought, would affect the reading of the instrument.

Mr. Warnerke said, in reply to Mr. Davis's question, that a single spark was sufficient to excite the photometer. As to the duration of time necessary to expose the instrument, it really made no difference whether the light was bright or dull, nor did it increase the intensity if it were exposed a long or short time. It was best, perhaps, to give an exposure a little longer than was absolutely necessary to excite the calcium. With respect to Mr. Cadett's observation, he might say that to prevent the effect he referred to, it was his practice to examine the actinometer under the focussing-cloth, after the eyes had been for a few seconds in darkness. There was really no likelihood of error arising from this cause, as the five minutes during which the calcium suffered no change in its phosphorescence gave plenty of time to allow the eye to recover itself.

The President, after referring to the experience which he had some years ago with chloride of silver as an actinometer, asked the meeting to pass a vote of thanks to Mr. Warnerke.

Mr. B. Jones then read some observations on the possibility of developing gelatine emulsion without the use of pyrogallic acid. Mr. Jones recommended the introduction of pyrogallic acid into the emulsion, under certain conditions: firstly, that the emulsion must be fit for use at the time of the introduction of pyro.; secondly, it must be used as soon as the addition has been made; and thirdly, the plates must be thoroughly dried.

Capt. Brownrigg showed some prints from large gelatine plates taken in the months of October and November.

The President then announced that according to the rules, the President, the Vice-president, the Council, and the Treasurer retired at that meeting, and that nominations for the election of officers for the ensuing year must be sent to the assistant secretary not later than Monday next.

The retiring officers were:—James Glaisher, Esq., F.R.S., president; Capt. Abney, R.E., F.R.S., vice-president; Messrs. Bird, Hughes, Mayland, Robinson, and Thomas—council; and J. Spiller, Esq., treasurer.

The proceedings were then adjourned until February 10th.

Manchester Photographic Society.

The usual monthly meeting of this Society took place at the Memorial Hall, Albert Square, on Thursday, the 8th instant, Mr. Charles Adin, President, in the chair.

The minutes of the previous meeting were read and confirmed, after which Messrs. S. D. McKellen and D. E. Benson were duly elected members of the Society.

It was proposed and unanimously agreed that at the next meeting (in February) an extra tea be provided, for which the members are to pay 2s. 6d. each. In order to provide some subjects of interest for this extra evening it was considered advisable to appoint a committee of six gentlemen. The following were proposed to form this committee:—Messrs. Charles Adin, Alfred Brothers, F.R.A.S., G. A. Brookes, W. G. Coote, J. W. Leigh, and the Hon. Sec.

Mr. Alfred Brothers, F.R.A.S., then read a paper on "Photographic Copyright" (see page 29), after which a long discussion took place. The almost unanimous opinion of those present was in support of Mr. Brothers' views, and it was arranged to call a special committee for the purpose of framing resolutions to be placed before the Society at the next meeting.

Mr. JAMES YOUNG then read a paper, entitled "The Platinotype Printing Process," (see page 28), and illustrated the working of the process by practical demonstrations.

Mr. PARKINSON (of Bolton) presented to the Society a very interesting picture, an enlargement from a negative taken by the aid of the electric light. The subject was a group of some 250 people. It was considered a very capital photograph, and for which much credit was due to Mr. Parkinson.

Mr. M. NOTON exhibited a sample of Russian glue and a dry plate which he had prepared by this sample of glue instead of gelatine. He informed the members that he had developed some of the plates, and the result was highly satisfactory.

A vote of thanks was passed unanimously to Messrs. A. Brothers, James Young, Thos. Parkinson, M. Noton, and the Chairman, after which the meeting was adjourned.

PHOTOGRAPHIC SOCIETY OF IRELAND.

THE usual monthly meeting of this Society was held on Friday, the 9th inst., in the Royal College of Science, Mr. JOSEPH WOODWORTH in the chair.

The minutes of the previous meeting having been read and confirmed, three new members were elected.

Dr. CHARLES R.C. TICHBORNE read a paper on "The Application of Photography and the Gas Lantern to Scientific Education." The pictures exhibited to the meeting were shown with a gas lantern, in which one of Sugg's 100 candle burners was used, and it was claimed by Dr. Tichborne that the inconveniences of paraffin and the trouble attending the oxy-hydrogen light were got over by the use of gas, which could be more easily arranged for the general purposes of every-day use in a lecture theatre.

Mr. J. V. ROBINSON communicated to the Society the fact that in the development of gelatine plates he found that it was not at all necessary that the ordinary developing solutions should be freshly mixed, but that, on the contrary, in his opinion, it worked better after having been mixed for a day, and used over and over again in an ordinary dipping bath.

A somewhat animated discussion then took place with reference to this innovation, which is generally recommended by most gelatine workers as a thing to be avoided. A perfect negative was then developed with a solution 24 hours old, and which was of very dark color, but produced no evil results in the way of stains or markings. The development was found to proceed as rapidly as with a newly-made solution.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Board of Management of this Association held their monthly meeting at 160A, Aldersgate Street, on the 7th inst. The minutes of the previous meeting having been read and confirmed, Mr. T. G. Snowdon was elected a member of the Association.

The report of the Board of Management was then prepared to be submitted at the annual meeting, which will be held at the above address at 8 p.m. on Wednesday, Jan. 28th, when it is hoped all members who can do so will attend.

PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

A meeting was held Nov. 4th, 1879, PRESIDENT NEWTON in the chair.

The minutes of the last meeting were read by the SECRETARY, and, subject to some corrections by Mr. Newton in relation to the cyanide developer to be made before publication, were approved.

The SECRETARY also called attention to a notice received from the clerk of the Institute informing him that some of the journals placed upon the table were missing on the morning after the meeting, and the series broken up thereby; that at the last meeting the *London Photographic News*, No. 1,095, for Aug. 29, 1879, was taken away.

Any member can have the use of the journals by proper application at the desk. It any gentlemen has taken away numbers, he has probably done so under a misapprehension, and the clerk would be very glad to have them returned, etc.

Mr. MASON, on behalf of the committee on lanterns, reported that they had anticipated having an exhibition to-night. Being election day, it had interfered with the plans of the committee, and they had been unable to obtain the lantern; consequently the exhibition would have to be postponed till the next meeting.

Mr. MASON also exhibited to the Section some prints from dry emulsion plates exposed at Central Park; also two instantaneous pictures from wet emulsion plates, both made in shadow, illustrating the rapidity of the process, and that it will work well in shadow or on dimly-lighted subjects.

Mr. NEWTON. Those instantaneous views were both developed with the ferro-cyanide developer.

The objects, except at one end of the boat, were in shadow, but all of the detail in the shadow is perfect. They were made with a ten-inch view lens.

Mr. CHAPMAN. When you speak of a wet plate, you mean the bromo-iodide emulsion plate?

Mr. MASON. Yes.

Mr. CHAPMAN. Although I have not quite finished my experiments on colored glass, yet I might speak of some peculiar properties noticed thus far. It seems that every different kind of chemical preparation which we use in photography is influenced by light of a different color; that is, waves of light of different lengths. That has probably been known to various parties working as Capt. Abney does, but I was not aware that the effects differed so much as they do. What first surprised me was while trying some colored glasses before the spectroscope I found that some of them showed the blue light through quite distinctly. Other specimens did not show any blue light through, but cut off all of the solar spectrum before it reached the blue—in the green. Mr. Mason tried some on albumen paper, and that which showed the blue light through had little or no actinic effect, or much less than that which did not show the blue. I continued a little further, and I found that the emulsion plates have a similar tendency: that is, this ruby glass here is more non-actinic to colored paper and emulsion plates than the orange glass is, and still the orange glass is more non-actinic to the old iodide of silver bath plate, as we usually work in a photographic gallery. Light coming through the ruby glass would fog a plate in the ordinary photographic gallery a great deal quicker than when the proper tint of orange glass was used; but with the emulsion plate or chloride of silver it is far more non-actinic than either orange or yellow glass, that is, with a single thickness. Two thicknesses of that orange (exhibiting) is equal to one of ruby in the emulsion plates. This is the only orange glass I can find in the city which is effectual in that way; all the others admit a good deal more actinic light. This orange glass is made in the city. I am going to have some prepared just double the thickness of this now shown; that is, just double the depth of color, which will then be equivalent to ruby in the chloride or bromide emulsion processes, and still be a great deal more non-actinic in the usual bath process. I think you will see by looking through this sample that the light is much easier to the eye than the light through the ruby glass.

Mr. NEWTON. The illumination in the dark room is better

Mr. CHAPMAN. This color comes nearer to the visual portion of the spectrum; that is, the D line. These have the same relative actinism or non-actinism now under the *worst* conditions, and a good deal more so under some other conditions. This orange glass, as soon as I can get some of it made, will be tested, and then the manufacturer will know just what tint to make for photographers' use, so that they can have it in single thickness, which can be guaranteed to be non-actinic in emulsion processes with any degree of sensitiveness they want, and still have it perfectly easy to the eye in daylight.

Mr. MASON. These statements are very interesting from the fact that it is now almost impossible to get an orange or yellow glass which will keep out the actinic rays sufficiently. The difficulty in procuring such a glass led me to adopt this golden ruby, which I have used some two or three years. It is a very disagreeable glass to work before. If this glass proposed by Mr. Chapman is brought into the market, it certainly will be a relief to those people who have been searching for one which would keep out the actinic rays sufficiently, and still leave such a large amount of illumination in the room as to make it unnecessary to have any artificial light. For the past six months I have used that ruby glass in my chemical room window, which is about three feet square. I can feel the bad effect of it on my eyes: within that time I know it has injured my sight very materially. When I first began to work before it it was really painful; but though I have now become accustomed to it, I should be very glad to exchange for something better.

Mr. Taylor. There is a kind of glass manufactured by Forrest, of Liverpool, which is very non-actinic as far as regards bromide of silver, That ruby glass I would not trust a sensitive plate before for a moment; it would fog certainly.

Mr. Mason. I cannot agree with Mr. Taylor, as that ruby glass is the same before which the pictures I exhibited here to-night were developed. My light is from an open lawn and north sky.

Mr. Newton. Mr. Mason's window is particularly non-actinic to an emulsion.

Mr. Chapman. There are some preparations of aniline colors which I have mixed with gelatine, which are even more non-actinic than any of these glasses. There are doubts, of course, as to the tints remaining unchanged any great length of time without the film of color is sealed up between two pieces of glass. In some of my experiments with the spectroscope I have done that, because there is none of this glass here which is sufficiently flat and optically prepared to produce an image through, and so I took flat glass and coated it with this preparation of aniline colors mixed with gelatine, and it makes a much more non-actinic film, and still lets more light through than either of these glasses. But as I said, there are doubts about it continuing so. I will get some of this glass prepared double thickness of color, &c., which will be perfectly easy to work before, and at the same time be fully as non-actinic as ruby is, and more so in some cases.

Mr. Newton. In developing an emulsion plate or a bath dry plate with an alkaline developer and pyrogallic acid, the trouble comes where there is any actinic light present after the developer is floated over the plate, not before. There is no trouble from ordinary dry plates, whether made by emulsion or by the bath process, until the alkaline developer goes over the plate. Then the sensitiveness of the plate, while that developer is on, is increased many-fold. I have fogged plates in developing by a kerosene lamp covered around with two or three thicknesses of ordinary wrapping paper, and with the flame turned down quite low. I spoiled two very beautiful 8 by 10 negatives by holding them up towards the lamp covered with the paper, while the developer was on, to see if the developer had gone far enough; the fog struck it at the top and ran down to the bottom. I was mystified to know how it could be. I saw the effect, but didn't know the cause at that time. But I had used my pneumatic holder, which covered and protected a circle of about three inches, and when I came to fix the image I found that the covered circle was perfectly clean, and I saw very quickly what the trouble was; the fog was much stronger at the top, nearest the light, and very little at the bottom. So I put the light further away and turned it down, and I had no more trouble.

Mr. Taylor. If this one hundred-fold of sensitiveness be imparted to an emulsion plate by the developer, would it not be advantageous to apply such developer before it is put in the camera?

Mr. Newton. That has been done a great many times. In making instantaneous plates I always flow over the accelerator, which is similar to the developer without the pyrogallic. An illustration of the effect was given here before one of our meetings, where the negative in contact with the sensitized plate was held up to the gaslight one second, and the picture was fully developed during exposure. But it is preferable to have the developer under control, to know what is going on; that is the objection to developing. But instead of putting pyro. in, I flow the plate with a solution of carbonate of soda, 15 grains to the ounce, 180 grains to 12 ounces, and in that 12 ounces 2 grains of bromide of ammonia, increasing the sensitiveness about six times. If there was a little pyro. added it would be still more sensitive, but it is as sensitive as I can manage it without that addition.

I have experimented somewhat with the aniline orange colors, and I would like to know if Mr. Chapman's experiments in reference to their fading have been the same as mine. If I make an orange color solution with gum, collodion, or varnish, and cover one-half of the glass flowed with it, and lay it out in the sunlight for a day or two, I find that the orange color is pretty nearly gone, but still a very deep yellow remains which does not appear to change, and the actinism has not changed any, or, if so, it is scarcely perceptible. The yellow and the orange seem about the same, although the yellow lets through very much more visual light, as Mr. Chapman says, than this orange colored glass.

Mr. Chapman. Are yours compound colors or simple ones

Mr. Newton. Compound.

Mr. Chapman. Mine is a simple color from the coal.

Mr. Newton. I used the scarlet and the orange.

Mr. Chapman. This is bought in commerce as a simple color. It has the largest degree of fluorescence of any of the salts. The physicists or chemists bought it up for that purpose, but they soon found that the dyers were buying it, and now I think they buy it all. It gives an orange color which they cannot get in any other way, or heretofore never have been able to produce. I flowed a plate and put it in my window after having covered half of it with black paper, leaving the other half exposed, and took another piece to Mr. Mason. I was gone from the city about six weeks: when I returned I found it had not changed at all, as far as I could see. Mr Mason can tell what he did with the piece I left with him.

Mr. Mason. The sample Mr. Chapman brought to me to test was a single sheet of glass flowed with the coating which he names. I wrapped one-half of it in a peculiar black paper, covered both sides, and end and edge. I then placed it in a south window, fastened it on the sash, and left it there. After it had been exposed two months I took it down for examination. I could not see that there had been any change in the tint. There was a tendency of the preparation to leave the glass where it was thin, on the edge; but I suppose that Mr. Chapman had not used any precaution against that. It now remains in the window. I have not examined it during the last two or three weeks.

Mr. Chapman (to Mr. Newton). Yours was mixed with collodion, was it not? that is, it can be mixed with collodion? This is not. This is only soluble in an aqueous solution. Therefore you must use something like gelatine, which is a perishable vehicle. The collodion when it is dry, as dry cotton, will keep: it won't attract moisture like gelatine; still, I don't know but this might be mixed with a chromate solution and then exposed with the gelatine and rendered insoluble. Gelatine so prepared, I believe, is rendered insoluble by light.

Mr. Bierstadt. It may be fixed by alum and not affect the aniline color. Have you ever tried glass covered with gelatine and toned with permanganate of potash? That also gives an orange color and becomes insoluble.

Mr. Chapman. I will try that. Have you had any experience with regard to the fading out of gelatine where it has been colored with bichromate?

Mr. Bierstadt. No.

Mr. Newton. Speaking of using alum to coagulate it, does not that take away the transparency?

Mr. Bierstadt. I do not think it would affect it at all if you were to fix it with bichromate of potash.

Mr. Newton. You said, use alum; ordinarily it coagulates gelatine and acts like tannin.

Mr. Chapman. Does the permanganate change it?

Mr. Bierstadt. That leaves it transparent and permanent. In my dark room I use the dark orange colored paper. I prefer it to glass; it costs very little. I never had any trouble with it. I never tried anything so very sensitive as the gelatine emulsion, which is said to be twenty times more sensitive than the ordinary bath plate.

Mr. Mason. I would enquire of Mr. Taylor whether the glass which he speaks of is a commercial article, and has it been tested by use?

Mr. Taylor. Yes. It is a commercial article obtainable from Messrs. Forrest, of Liverpool. It is an exceedingly dark yellow color—a dirty orange. I heard Mr. Forrest say that it contained carbon, which may give it its smoky appearance.

Mr. Mason. I have used two or three thicknesses of orange glass, which keeps out the actinic light sufficiently; but at the same time the room is too dark to manipulate in comfortably.

Mr. Taylor. There is an aniline preparation called aurine, of the consistency of ordinary resin; it dissolves in alcohol or ether, and when mixed with collodion it makes a very good preparation for coating glass. A little dragon's blood added gives to it a ruby tint, that answers very effectively as a dark-room window for even extremely sensitive plates; but I do not know whether it is durable. Dragon's blood is fugitive; it will not stand against strong sunlight.

After some discussion about the recent blue glass mania, the Section adjourned.

Talk in the Studio.

ALLEGED THEFT.—We learn from the Greenwich Police news in a local paper that Thomas Watkinson, 35, of 36, Rye Lane, Peckham, was charged with stealing 10 oz. of nitrate of silver, the property of his employers, Messrs A. and G. Taylor and Co., Victoria Works, Forest-hill.—Mr. W. Smith, one of the prosecuting firm, stated that in the prisoner's department more silver had recently been used than ought to have been. It was proved that when taken into custody two packets of the silver were found on the prisoner, who made contradictory statements concerning them.—After some evidence of identification the prisoner, who denied the charge, was remanded for a week. On a subsequent appearance he was found guilty, and sentenced to three months' imprisonment.

THE MANCHESTER MURDER.—The police have been pursuing their inquiries with energy in every quarter with respect to the murder of the servant girl, but have not succeeded in capturing the murderer. The crime is awakening an unusual amount of excitement in Manchester and the neighbourhood. The Home Office have offered a reward of £100 for the apprehension of the murderer, and a like sum has been offered in Manchester. One of the means suggested of tracking the murderer is the course which was followed in the Blackburn murder—namely, the employment of a bloodhound. The remains of the girl Sarah Jane Roberts were buried in the cemetery at Christ Church, Harpurhey, on Saturday. Prior to the closing of the coffin it was taken out in the garden, and, at the request of Mr. Bent, the superintendent of police, a photograph of the girl with her eyes open was taken by Mr. Mudd, photographer. This was done owing to a suggestion made to Mr. Bent that probably a vivid impression of the murderer would be found fixed on the eyes of the girl, and he intends to examine the photograph with a powerful microscope.

STILL ANOTHER LETTER COPYING PROCESS.—Herr Adler has communicated to the Vienna Photographic Society a multiplying process based upon the use of the *glue plate*, consisting of gelatine, glycerine, and water (though the last-named ingredient is present in a smaller quantity than usual), used in the hektograph and other similar processes. For writing or drawing, Herr Adler uses a concentrated solution of alum, to which, in order to render the writing or drawing visible upon the paper, a few drops of some aniline colour are added. Before laying the writing or drawing upon the gelatine surface pass a damp sponge over the latter, and allow the moisture to sink in for a few minutes so as to have a greater effect upon the alum. Then lay the written side downward upon the gelatine, and, after the lapse of a few minutes, on removing it, the writing will be found reversed and eaten into the gelatine film as if it were engraved. By means of an india-rubber roller a little common printing ink is spread over the plate and absorbed by the lines sunk by the alum, and again rejected on the application of moisture upon the paper laid down upon it, and smoothed over it by the flat hand. When removed this paper will have upon it the first impression of the writing or drawing. For each succeeding impression the plate must be inked, as in lithography, by the india-rubber roller. A considerable number of impressions can be taken.

To Correspondents.

W. SALMON.—An open north or north north-west light will be useful. A very steep top-light, inclining to a low side-light, will do well. The precise angle is unimportant, and may be left to some extent to the necessities of the builder. A steep incline has several advantages. It keeps clean well, being well washed by rain. It rapidly shoots off wet, and there is little risk of drip. Light passes through with little reflection. Remember, that rays which strike the glass at right angles pass direct through, whilst those which strike at an angle are partially reflected, and hence, a steep top-light admits more light than one with little incline. An ordinary ridge roof shape we recommend with glass at both sides, both roof and side. South side usually covered with blinds.

J. D. M.—In our YEAR-BOOK, which will be ready in a few days, you will find full information on the various forms of the gelatine process. You must not expect to succeed with the same iron developer used for wet collodion.

G. BUFFARD.—The use of too high a temperature, especially if continued for any length of time, would undoubtedly have a tendency to make gelatine thin than fluid. Long-continued heat converts gelatine into meta-gelatine, which remains fluid.

MR. WARNERKE'S PAPER ON ACTINOMETERS.—We are favoured by Mr. R. J. Friswell with a communication pointing out some errors in the symbolical statement of formulæ in Mr. Warnerke's paper, and some caustic strictures thereon. These appeared in our last, as our correspondent observes, the same as they appeared in the Journal of the Society from which we reprint the paper. As regards the NEWS the explanation is very simple: it is a copy of the authoritative publication, no proof having come under the Editor's eye, he being confined to his room by illness. We had, it is true, notification from an officer of the Society of some errors in the notation, but too late to be of service. We forbear inserting our correspondent's comments on the Committee of Publication and Editor of the Society's Journal, because, apart from our indisposition in this journal to comment on the conduct of another, we know, as Mr. Friswell knows, the difficulty of securing immunity from printers' errors, especially in the haste with which a journal must often be got ready for press. It is possible that neither the able and estimable Editor of the Society's Journal nor Mr. Warnerke ever saw a final proof of the paper. In place of the erroneous formulæ, Mr. Friswell sends us the following:—

No. 1.—

$$2HgCl_2 + 2\,[NH_4]\,C_2O_4 + Hg_2Cl_2 + 2NH_4Cl = 2CO_2$$

No. 2.—

$$2HgCl_2 + C_2O_4H_2 = Hg_2Cl_2 + 2HCl + 2CO_2$$

He adds:—"It is absolutely impossible for hydrogen to be set free, as the second of Mr. Warnerke's formulæ indicates, for in the presence of the Hg_2Cl_2 the nascent hydrogen would be acted on thus:—

$$Hg_2Cl_2 + H_2 = 2Hg + 2HCl$$

i.e., the mercurous chloride would be reduced to the metallic state, and hydrochloric acid produced. It is a thousand pities that so excellent a practical paper should be spoilt by such inaccuracies, though they may be looked upon as comparatively venial faults in one who so thoroughly understands his own particular profession as does Mr. Warnerke." We are obliged to Mr. Friswall for his communication, and think he will agree with us that the correction itself is sufficient, without comment or epithet which might seem intended to wound or humiliate an estimable contemporary.

L. and W.—Gutta-percha is often adulterated, and we have found it unsafe for use as a silver bath. Gelatine with alum would not much improve matters, and would be unsuitable as a coating. You must treat it with some neutral substances which will not act upon nitrate of silver. A good thick coating of shellac varnish would protect it, as would also also a coating of paraffin. Paraffin sets pretty quickly. You must make the gutta-percha hot, and apply the melted paraffin with a brush or spatula to facilitate its covering quickly. 2. We fear that the treatment of the picture attached to the broken glass may involve some difficulties. Do you know with what the print has been treated to make it transparent, and with what it has been cemented to the glass? A knowledge of these points is necessary as a guide to treatment. If the print have been attached to the glass by means of gelatine, gum, or similar substance soluble in water, then that must be removed first of all. After that, it is possible that heat, or re-waxing, or applying whatever substance has been used to make the print transparent, might be useful. Personal examination and the exercise of personal judgment alone, however, can be of real service in determining what should be done.

J. S. C.—We do not remember the precise formula for the burnishing preparation. About one grain of Castile soap in an ounce of alcohol, so far as we remember. Thanks for paper.

YALNIF.—The subject of portraiture without a studio involves too many considerations to be satisfactorily treated within the limits of an answer to correspondents. We hope to devote an article to the subject in our next, giving the best advice we can offer.

J. KEEN.—By a picture on an iron plate we presume you mean a ferrotype. To secure a ferrotype non-reversed, you must use either a prism or a mirror attached to the lens. An optician will supply you with what you want. We believe the Autotype Company supply something of the kind for producing non-reversed pictures.

F. DANN asks us to state that the address of Mr. J. Calder, inventor of the steam burnisher, is 79, Hudson Road, not 179, Maxey Road, Plumstead.

DR. VOGEL.—We have addressed and posted the letter enclosed. We hope to write to you soon.

B. J.—There are no restrictions of any kind to your use of the gelatino-bromide process. It is perfectly free, and requires only careful study and practice.

PATENTS.

COMPILED BY MR. DES VŒUX,

Patent, Trade Marks, and Photographic Copyright Office, 32, Southampton Buildings, Chancery Lane, London.

No. 43. JOSEPH ETTLINGER, of Lawrence Lane, in the City of London, "An Improved Construction of Photographic Album, and Leaves therefor." Dated 6th January, 1880.

The Photographic News, January 23, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHERS' ASSISTANTS, THEIR PAY AND QUALIFICATIONS —THE PROGRESS OF ELECTRIC LIGHTING.

Photographers' Assistants, their Pay and Qualifications.— "Why is it that photographers' assistants receive such low wages?" was a poser addressed to us the other day, and which we answered, after some moments, with the query, "Do they receive low wages?" There was not sufficient time for a good think just then, but lately the subject recurred to us on looking over a list of "wanting places" in a German photographic journal. Here, strange to say, in nearly every instance higher terms were mentioned than those usually found in our columns; but then we must at once observe that with us in many cases there are no terms mentioned at all. Particularly in the case of better appointments is there no reference to terms in the English journals, and this may in a great degree account for the idea that in Germany the photographer's assistant is more highly paid than in this country. For it must be borne in mind that thirty shillings a week in the Great Fatherland means far more than that sum in Great Britain, and hence, if we see the same terms advertised alike in the journals of both countries, we say at once that the Englishman is far less liberally paid than his cousin German. But we must not forget an important consideration. It is this. The German assistant—and we say so in no way to disparage our own countrymen—is usually more accomplished than the majority of English assistants; or, in other words, the man who gets his thirty shillings a week in Germany is required to be more skilled and practised than he who commands the same sum abroad. The foreign assistant, may be, has enjoyed a scientific education, and has besides, in all probability, served some sort of apprenticeship. Now this is precisely where the ordinary assistant in this country is found wanting, and why they do not command more money. A young man over here, if he has received a sound education, has a liking for photography, and some aptness for science and art, and who, moreover, has been trained for a few years in a good studio, would not be long finding an excellent situation, and one of a lucrative nature. We have the case of such an assistant in our eye at the moment of writing. A well-educated lad, he came to us at the age of sixteen or seventeen; we were fortunate in being able to recommend him to a vacancy in a large establishment where half a dozen photographers of different grades found employment. His wages for the first year were fifteen shillings a week, and afterwards one pound. His highest salary here was five and twenty shillings, and finding that there was no prospect of advancement for a time, those in front being still young and active, he discreetly determined to seek a fresh situation. He had been well grounded in his work, had printed in carbon, and knew something of photo-lithography. His chief defect was a lack of experience in posing and portrait work, and yet, strange to say, it was to do this kind of work for which he received an engagement. He was a capable man, knew several branches of photography, and therefore had as many chances. In two years time he had so far satisfied his employer that the whole direction of a branch establishment was placed in his hands, and we have little hesitation in saying that he produced some of the best work turned out at his establishment. His salary was first two, then three, and finally four pounds a week, and, speaking from a knowledge of facts, we say that he was very much underpaid. But four guineas is by no means an uncommon salary in the case of competent assistants, and one who is something of an artist and can retouch a negative as well, may command very liberal terms indeed. We know a German gentleman recently engaged in a Brighton firm—he may be there still, for aught we know—who was engaged at a salary of £[illegible]00 per annum, and who further demanded a substantial increase of his salary within a year, and got it. But there are assistants and assistants, it must be remembered, and this brings us to the point, whether the time has not now arrived when a broad and distinct line should be drawn between classes of assistants and particular names applied to those capable of particular services. We have got into a bad habit of talking about operators. The word operator is objectionable on every score, and we are entirely of Mr. Francis Bedford's opinion, who says that the term should be expunged from the photographic vocabulary. Everybody knows what a printer is, and if a man can do no more than print, he cannot expect very high wages; but a photographic printer, for all that, is an important personage, and if his vignettes are soft and his toning perfect—to say nothing of printing dodges—he can command substantial wages. But he cannot expect to receive so much as the assistant, who not only poses, but produces a well-modelled negative, and at a pinch can use a BB pencil with effect upon the film. The latter is in every way a qualified assistant, and he can only be forthcoming out of a thoroughly good studio. If our youths would only commence under good masters, they must, supposing they have any aptness to the work at all, in time become capable assistants. Unfortunately, it may here be said, the days of apprenticeship are over, but would-be photographers have as much necessity to learn as ever; there is no royal road to photography, nor to any other calling, and the reason why we have so many badly paid assistants at the present day is because we have so many badly-trained individuals.

The Progress of Electric Lighting.—The question of electric light illumination is once more under discussion, thanks to the indomitable perseverance of Mr. Edison and some half dozen pioneers who seem determined to discover the problem of household lighting. In the meantime we think that so far as the experiment on the Thames Embankment is concerned we are going backward instead of forward. Instead of opal globes they are now employing glass of a more transparent character, and great credit is taken by reason of the circumstance that the issue of light is some twenty or thirty per cent. more than it was formerly. By the same argument they might do away with the globes altogether, and expose the naked incandescence to the public gaze, when the full hundred per cent. of light would be forthcoming. But then we get back whence we started. The electric light has hitherto been inapplicable to ordinary purposes because of its blinding character, and it was because this was obviated so well by the opal globes that the electric light became popular once more. What matters it if we do lose fifty per cent. of the light, if the other fifty gives us a finer and softer illumination than can possibly be obtained in any other way? At the Royal Institution last year we saw an electric light shut in on all sides by white paper, the result being a cube of light that was at once subdued and brilliant. It was said that something like seventy per cent. of the electricity was absorbed and lost by the screen, but as the light fulfilled its purpose, this loss was altogether beside the question.

PHOTOGRAPHY BY MEANS OF THE ELECTRIC LIGHT.

BY T. PARKINSON.*

FROM the very great interest excited amongst photographic and landscape bodies generally by the "Wonderful Group Photograph" taken in the Albert Hall, Bolton, by the means of the electric light, and because it has been accredited as "a feat probably unprecedented in the annals of photography," I have great pleasure in sending, for your coming ALMANAC, further details of so interesting an event.

Such a *fait accompli* may be regarded as proof evident that with the electric light, successfully managed, photographs may henceforth be taken of large groups in evening

* Intended for the YEAR-BOOK OF PHOTOGRAPHY, but received too late.

dress at concerts, balls, conversazione, &c. Wedding breakfasts, with the inevitable bridecake and costly presents, groups of actors on the stage and all the appropriate scenery, &c.—in fact, in any large room (public or private) wherever the electric light can conveniently be introduced, and with a certainty of success, too, greater than with ordinary daylight.

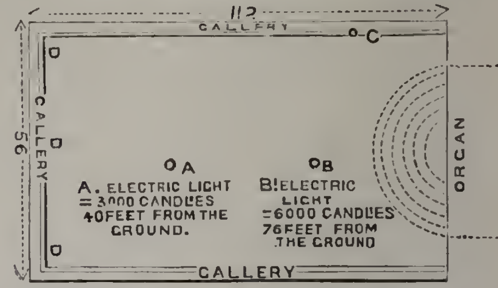
In the Hall in question, it would be an impossibility even on the lightest day in summer to take such a group. Impossibility, did I say? That may be more than I can tell, for who would have believed, three years ago, that photography could have come to such perfection—thanks to our enthusiastic amateur dryplate workers—that a group of over 100 persons could be taken in a public town hall at 10.45 p.m., and that, too, without any inconvenience or discomfort to the group, or to the rest of interested company in the room, excepting, of course, the few minutes occupied in arranging themselves.

The feelings of excitement and some little pride on my own part at such a success, and the curiosity and wonder with which such a photograph was regarded by all interested in the experiments, have now become somewhat sobered down. Still, the fact—the historical fact, if I may so be allowed to call it—deserves to be recorded more in detail than just the mere mention of it, and I trust it may not be without its value in the diffusing of knowledge in stirring up other experimentalists, in creating a feeling and love for science and art, and a very much increased appreciation of the infinite wonders and beauties of Nature, amongst many who, without the facilities which microscopy, photography, and electricity so lavishly afford, would probably remain entirely strangers to such enjoyments. And again, may not such an appreciation and love for the wonderful bring many to look from Nature up to Nature's God, whose first great work was, as recorded, *Light*—that wonderful *light*! Who can tell what it is?—what its powers?—what its limits? That tiny lustrous *electric* spark, dazzling in its brightness, generated by powerful magnets and steam power to lend its wonderful aid for a brief interval of time to the aid of its sister sciences, microscopy and photgraphy, and then to return again, without perceptible loss, to the bowels of the earth! Its present applications are so numerous that it would be difficult to enumerate them; and almost daily we find some new startling discovery which may open up some new field of labour. By its aid we can hear each other's voices though hundreds of miles apart, and as the lineaments of our faces can be handed down by photography, and interesting occasions, such as the one which is the origin of this paper, may be historically handed down to posterity, so also our very tones and voices may, by its aid (electricity), be collected and preserved for ages, and we may sometime possibly have the pleasure of *hearing* the hearty Christmas compliments and good wishes of our family friends coming bottled up in the customary Christmas hamper. Who can find language to express its wonderful powers and its marvellous influence on civilization? No one knows the benefits which it, with photography, will confer on art and science, and on mankind, when more fully developed. When we reflect that both photography and electricity are only yet considered as *infant* sciences, and how much has been done since their first discovery, we need not despair of further surprising advances, for they have not yet, by far, attained the limits of perfection.

The *Bolton Guardian* of Nov. 22nd, 1879, graphically reported of the conversazione in question:—"The scene in the Albert Hall on this occasion (Friday, Nov. 21) was brilliant beyond the power of expression. There were fashion, and youth, and beauty flirting about under the lustrous magnificence of the new-born electric light." It is not, however, my object to go into the microscopical wonders shown at the conversazione, which was a scientific treat indeed—*a very "feast of wisdom and a flow of soul"*—would that there were more such gatherings—but rather to give in detail the photographic experiments with the electric light.

That photographers may better understand me, it will be better to describe the capacity of the Hall, and where the lights were hung.

The body of the Hall, excepting the organ chambers, may quickly be conceived if I describe it as two perfect cubes of 56 feet each, with a domed roof from each side rising some 20 feet, or more, higher than the cubes. From a rope wire stretched from window to window across the Hall (56 feet) was suspended half-way across, at A an electric lamp (Mr. Raworth's, St. Mary's Gate, Manchester) calculated to give a light with Siemens's machine equal to 3,000 candles. This was about 40 feet, as near as



I can calculate from measurements which I have since made especially for this paper. At B was also suspended another lamp, 54 or 55 feet from the ground floor, and same height as the one at A, 70 feet from the group in gallery. This lamp, a modified Swiss, equal to 6,000 candles, was worked by a Gramme machine. Both machines were worked by a steam-engine (Marshall's) of five and a-half horse-power, and at a distance of about 35 yards from the Hall.

The whole of the management of the electric lighting, so successfully accomplished, was due to the indefatigable exertions of a brother amateur photographer, Mr. J. C. Sewell, who has gained a notoriety in the North of England as the introducer of this means of lighting in many public rooms, and in large shops. His own shop in Deansgate, Bolton, is lit by the electric light, being at present one of the new year's greatest attractions.

The gelatine plates used ($7\frac{1}{2}$ by $4\frac{1}{2}$) were Wratten and Wainwright's "instantaneous"; exposure forty seconds; a Dallmeyer cabinet portrait lens with $1\frac{1}{2}$-inch stop; and the development was alkaline pyro.

Water	2 ounces
Pyro.	6 grains

With not more than—

Ammonia and bromide potass. solution	15 or 20 drops
Ammonia...	1 ounce
Potass. bromide	60 grains
Water	2 ounces

The plate after exposure I first put into a flat porcelain bath, 8 by 5, filled almost with water from the tap, for about half a minute, while I measured out the two ounces of water and dissolved in it the six grains of pyro. Then letting the water run off, I poured over it the plain pyro and water for a few seconds, and into the glass measure dropped about five drops of ammonia solution; then run off from the bath the pyro into the measure, and applied it again to the negative in the bath.

The picture began to show itself with the ten drops, and then I added the other five drops at a time till sufficient density was obtained. This plan I found to be better, and to give much brighter results than by prolonged development. I should think the full density was obtained in less than two minutes; then I washed well, and afterwards, as a preventive from frilling, though it did not seem to require it, I gave it a dose of alum water and alum

(*quant. suff.*), and washed again well. Then fixed in the ordinary way in—

Hypo.	4 ounces
Water	1 pint

Again washed well, and let it dry spontaneously. It is better to varnish all gelatine negatives before printing, but I sent this negative purposely unvarnished to the Autotype Company for enlargements.

From my experience of over twenty-seven years in amateur photography, and having tried all kinds of dry plates —and their name is legion—I have no hesitation in saying that the gelatino-bromide plates are the best; and now that they are prepared commercially as well or better than any one can prepare for himself, I should certainly advise all to purchase them ready prepared, as I would advise any novice in photography to buy his collodion instead of making it for himself. Let me give a word of warning to those who may try to work gelatine plates, to see that the cameras and dark slides are quite light-tight, and to change the plates and develop with as little light as possible. I use a small lamp under a "hock" bottle, and rear up in front of it a glass about twelve by six, covered with orange paper. This plan allows any one to see how to mix the developer. Finger the plate as little as possible during development, and be sure to let it dry spontaneously. If you apply heat to dry it whilst the gelatine is still moist, you will certainly spoil the negative. Not only do the gelatine plates merit the distinction I have given them from their simplicity and cleanliness of the manipulation, but also from their surety of success with ordinary care to those experienced in dry plate development and from their much greater sensitiveness. I have been able to take good portraits in my sitting-room in less than two seconds, and to have proved them by trial in summer to require only about half of the time of a wet plate—that is, in landscape photography.

I should mention that another enthusiastic amateur, Mr. Shipperbottom, of Bolton, who first gave me the idea of photographing the group, was also successful in taking the same group stereo size from the opposite gallery. When I first sent up the prints to your office I did not then know that Mr. Shipperbottom had been successful, or I should have been glad to have mentioned it. He, however, must share equal honours with me in the affair; and I am only sorry he did not let me know sooner how his experiment turned out. I tried one plate the night previous, by which I came at the necessary exposure to be given. No reflectors were used, and no shades over the lights.

ON ACTINOMETERS,

BY LEON WARNERKE.*

Now, suppose we remove the photometer to the dark room, evolution of gas is still going on, because the quantity dissolved in the liquid during the exposure cannot be contained by it in the dark, the solubility being lessened. To this must be added other causes, besides difference of temperature. I can compare this action to the following illustration:—Suppose a sponge, which we may compare to the sensitive liquid. Let us pass a stream of water from the tap on the sponge—this is the light. Next suppose we put a graduated measure under the sponge, in order to ascertain the amount of water coming from the tap. Naturally it will take some time after the tap is turned on before any water will come into the glass measure, because the sponge will absorb it. Likewise, when we stop the water from the tap, it will still ooze from the sponge. If we squeeze the sponge, or by any other means alter the equilibrium of the sponge, some additional water will flow. Exactly the same happens with this actinometer. The larger the sponge, or the greater is the amount of sensitive aqueous liquid, the greater will be the errors arising. This consideration decided me to separate the motive part of the apparatus from the registering, and this form I successfully used for a period of eight years (fig. 6).

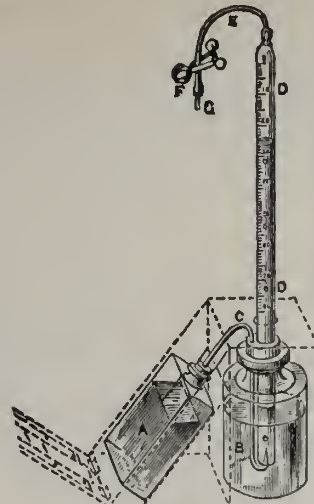


Fig. 6.

A is a flat glass bottle containing the sensitive liquid.
B is another bottle filled with glycerine.
C is a glass tube conducting the gases from the generator A to the bottle B.
D is a graduated glass tube.
E is an India-rubber tube with clip, F, inserted in the bottle, B.

By sucking the air through the glass, G, the glycerine can be raised to the zero point on the graduated tube, D. The gas produced in the generator, A, will pass in bubbles to the tube, D, displacing the glycerine, and the graduation of the tube will give the volume of gas. The reason glycerine is used in this apparatus is, that this liquid dissolves less carbonic acid than any other.

The following is a very interesting result obtained by Mr. Marchand in regard to this. Carbonic acid gas was collected over glycerine in the glass receiver—

On the 1st day	there was	74 c.c.	of gas.
2nd	,,	73	,,
3rd	,,	73 5	,,
4th	,,	74·1	,,
5th	,,	73·4	,,
6th	,,	72 9	,,
7th	,,	72·	,,
8th	,,	72·4	,,
9th	,,	72·4	,,

On other occasions 272·4 c.c. of carbonic acid gas, and 280·2 of air, was kept in two separate receivers over glycerine for over five months, and after this time the volume of gas was found to be 259·6, and of air 278·4, showing clearly that glycerine absorbs a comparatively small quantity of gas or of air.

To form a more exact comparison, I may here state that 100 volumes of water dissolve about 100 volumes of carbonic acid at the temperature of this room (15° Cent.), and 175 at freezing point.

It is also interesting to note the absorptive power of the sensitive liquid, and the following is the result:—

Through the solution of oxalic acid all the coloured rays pass.

Through the solution of ferric chloride the red, orange, yellow, green, and very little blue pass.

Through the sensitive mixture (as indicated) only red, orange, yellow, and green, but not a trace of blue pass.

In the form just described, this actinometer is very valuable for registering the accumulative action of light in all the processes requiring long exposure. I found it especially useful in connection with the asphalte process. The exposure required in this case in this season is sometimes as long as six days; and numerous experiments satisfied me as to the incalculable value and correctness of this actinometer,

* Continued from page 32.

In the model shown to you the diameter of the graduated tube is rather large. For processes requiring less exposure—for instance, for carbon printing—a smaller diameter is used.

Note.—The middle continuous curve shows the action of light on chloride of silver paper.

When still shorter exposure is to be registered, I could pretty correctly judge of the intensity of light by the number of bubbles of gas that can be observed at the one time ascending the length of the tube, or, in other words, the frequency of the bubbles.

In order, however, to estimate more correctly the actinic action of the light an apparatus was constructed (fig. 8), consisting of flattened long bottles filled with sensitive liquid. This bottle has a perforated stopper, and also the neck of the bottle, and in such a manner that, when it is put in one position as shown, the gas produced by the action of

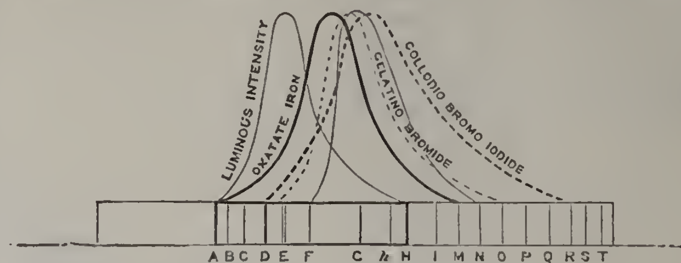


Fig. 7.

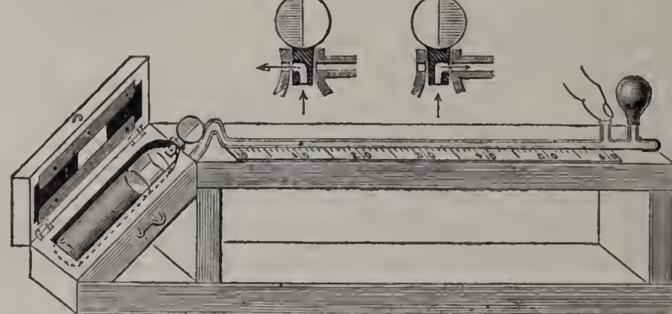
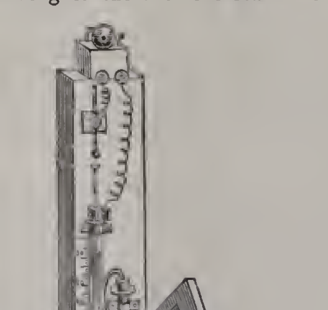


Fig. 8.

light will escape in the air. On the opposite side of the neck there is a long horizontal tube of small diameter, having at the other end two branching tubes; on the extreme branch is placed an india-rubber ball, while the other remains open. Through this last branch-tube is introduced a drop of mercury, and, after the orifice is closed with a finger, the india-rubber ball is gently pressed, which occasions a movement of the drop of mercury, and when it occupies the position corresponding to the *o* of the scale the finger is



removed. Now when exposure is to begin, the glass stopper is turned so as to occupy 2nd position shown; the gas then penetrating into the long tube will produce the pressure, and consequent movement of the mercury. The attached scale will register the amount of gas.

The aperture through which the light acts on the sensitive liquid can be altered according to necessity, by an arrangement applicable to all other forms of this moment.

In the course of my experiments it necessarily occurred to me to introduce an alarum, informing the operator of the exact moment when the amount of light was sufficient to produce the required action.

The apparatus constructed by me for the purpose (see figure) was formed of a flat bottle as before, to hold the sensitive liquid. The glass tube of the shape of the letter U was used as a receptacle for the glycerine. One end of this tube was connected with the flat bottle, while through the other end was introduced a cork float carrying a light platinum wire. When gas, produced by the action of light, begins to press on the surface of glycerine in the U-tube, the surface of it begins to rise in the other branch, the float is raised till it touches the small adjustable metallic ball forming the part of arrangement which is sufficiently intelligible from the examination of the diagram. On the top is fixed an ordinary electric alarum bell, which, as soon as the connection is effected, calls the attention of the operator to the fact that the requisite amount of light has been acting. In the diagram, for simplicity sake, the battery is not represented; but it consists of a small Le Clanché cell.

ILLUSTRATIONS OF THE EFFECT OF VARIOUS MODIFICATIONS OF THE DEVELOPING SOLUTION IN THE DEVELOPMENT OF DRY PLATES.

BY J. W. SWAN.*

Although the art of photography is but half through its decades of years, yet already it has undergone several clearly-marked transformations. Dating the birth of the art from

* Read before the Edinburgh Photographic Society.

the time of Niepce and Daguerre, we see now, after a sort of May - fly life enjoyed by that exquisite process, the Daguerreotype; it along with the Talbotype, which grew side by side with it, were supplanted by collodion; and we all remember through what various phases of life the collodion process has passed since its infancy.

The collodion process, by virtue of a strong inherent vitality, has had a longer lease of life than any of the processes which have preceded it, and is even yet living on in vigorous maturity. But, now, another transformation impends, threatening to oust, or, to some considerable extent displace, our old dear friend collodion.

The assailant of collodion to which I have made reference is, as you know, the dry process with bromide of silver. At present this process is associated almost exclusively with gelatine as a vehicle for the sensitive material; but the especial point of change is, in my opinion, not the employment of gelatine, but—first, the substitution of a dry process for a wet one; and second, the substitution of bromide of silver without free nitrate of silver, and the consequent development of the image from the haloid itself for iodide or bromo-iodide of silver, with free nitrate of silver as the sensitive material, along with its accompaniment of development of the image—not from the haloid, but from the extraneous nitrate of silver.

These two changes are unquestionably more radically inherent in the new method than the substitution of gelatine for collodion; indeed, I look upon it as well within the range of possibility that gelatine may be replaced by some other vehicle for the bromide, perhaps even by collodion itself, without the other, and, so far as the photographer is concerned, the more vital points of the change being materially affected: for what is important to the photographer is that the new method of working which he is now called upon to learn shall continue to be used according to the same general principles which now regulate its use.

I am fully convinced that the time has come when every photographer who is desirous of keeping his practice abreast of the times must make himself acquainted with the manipulation of dry plates. The advantages they possess are so enormous that to neglect to do this would be to miss that "tide which, taken at the flood, leads on to fortune."

The chief merit of the modern dry plate is its high degree of sensitiveness. Dry plates are not a thing of yesterday. They have now for many years offered to photographers certain advantages, such as readiness for use and cleanly manipulation; but these advantages were not sufficient to draw away photographers of the portrait studio from their old love, collodion. It required that there should be superadded to these advantages two others far more important than these, and, indeed, quite indispensable to the rendering them in any great degree useful in the studio. First, it was requisite that dry plates, in order to be in any large degree useful in the studio, should possess the advantage of greatly *superior sensitiveness*; and, second, that they should be capable of giving *results at least as good as those obtainable by* means of wet collodion.

It was, as you know, my good fortune, or my ill-fortune—for it has both good and ill fortune in it for me—to be the first to produce a plate combining all these qualities; that is, a plate useful for the ordinary work of the glass house. It seems to me that we cannot over-estimate the value of sensitiveness, if it be obtained without the sacrifice of quality. What an immensely-increased range of work and appliance it gives! We have only to think what value we used to set upon a lens of unusual rapidity, although it of necessity entailed a great sacrifice of pictorial quality—a lens (say) that worked in half the time of an ordinary portrait lens—in order to realise the value of a process that gives not twice, but ten times the power of the very expensive and not entirely satisfactory kind of lens I refer to. It is by no means one of the least of the many advantages attaching to a highly-sensitive plate that it enables a comparatively small lens or small stop to be used—not that the small lens is so much less expensive, for *that*, doubtless, is an advantage, but it is a comparatively small advantage. The great merit of a small lens over a large one is that it defines objects out of the true focal plane better; it produces, in short, a better picture than a large lens. Sir David Brewster used to say that the pictures produced by large lenses were caricatures of nature; that they consisted of an infinite number of incoincident images; and that photography would only be perfect when the chemist had produced a photographic agent so sensitive that it would be practicable to use a lens the size of the human eye in portraiture. Well, gentlemen, this ideal of Sir David Brewster's is realised, and more than realised, by the dry plates of to-day.

I received a letter the other day from a gentleman who had been photographing at Venice. He told me that he had just taken a view of St. Mark's on one of my plates, and that he had given it an exposure of two minutes. Then, thought I, instead of St. Mark's you have got universal blackness on your plate. But no! as I read on he said the negative was excellent. Reading on still further—"The diaphragm I used was a disc of cardboard with a pinhole in it."

But there are times when all the aid the optician can give you in the matter of rapid action may not be dispensed with —when, for example, the days are dark and misty, as they have so frequently been of late, and as they are apt to be, even in summer, in this uncertain climate of ours, and when, but for the double aid of a rapid lens and the most rapid plates, a great amount of work, interesting to the amateur and profitable to the professional photographer, could not by possibility be done.

How nearly independent of weather the combined powers of rapid plates and a rapid lens have made you is well exemplified in some negatives I have here, which were taken by gaslight by Mr. Laws, of Newcastle, and which you will have the opportunity of examining afterwards. But I am conscious that you fully appreciate the value of sensitiveness, and that, therefore, I need not pursue that point further. What I more particularly desire to do is to show you by means of negatives and prints what a great variety of effects are producible by means of dry plates, and how these different effects may be obtained. I wish to show that if a strong and vigorous negative is desired, nothing is more easy, when once the process of development is well understood, than to produce such a negative; or if, on the other hand, a soft and delicately-modelled negative is wanted, that quality can also be produced with equal facility, as well as every grade between those extremes.

In the development of dry plates we have a choice of two kinds of developer. We may use either pyrogallic acid combined with alkali and bromide, or we may use ferrous oxalate. I purpose shewing you the results of development by both these agents. Here are negatives developed by pyrogallic acid and ammonia, and here are negatives developed by means of ferrous oxalate. It is really a matter of no small difficulty to choose between these two means of developing the latent image; for, as you see, the quality of the negative is excellent in both cases. If we could always ensure that the exposure is correctly timed, then, I think, I should be almost inclined to prefer ferrous oxalate; but as we cannot ensure accuracy in the time of the exposure, I must, on the whole, give preference to pyrogallic acid, for it gives a greater power of modification and compensation in case of error than does the other agent.

I have here a series of nine negatives, all taken on the same batch of plates, and all exposed the same length of time, but each plate is developed differently, with a view to illustrate the effect of different proportions of pyrogallic acid in the developer, the bromide and the ammonia remaining the same. When you come to examine those negatives, as you will do presently, you will see that by varying the proportion of pyrogallic acid the utmost variety of effect is producible in the negative. With weak pyrogallic acid you have a weak and soft negative; with stronger pyro. you obtain strength in the image, and you can go to the greatest imaginable extreme in either direction.

(To be continued.)

The Photographic News.

Vol. XXIV. No. 1116.—JANUARY 23, 1880.

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In Memoriam.

It is with feelings that can scarcely find full and fitting expression here, while as yet the sense of our loss is so near and so vivid, that we have to record to-day, in these pages, the death of Mr. George Wharton Simpson. The active intellect and strong energy which made this journal what it is, and raised it from obscurity to the prominent position it now fills, have ceased to be; the vigorous hand that has conducted it these many years is still for ever. He, who last week was able to fulfil his editorial duties with the tact and ability that characterised all his work, has been suddenly taken from us in the fullness of manhood and enjoyment of prosperity. "Call no man happy till he is dead," said the Greek philosopher; and it is a consolation—but a poor one, truly—to know that if the achievement of a great work, well-earned success, troops of friends, and a painless death, constitute happiness on earth, these were not denied to him.

Our words here will be few, for there are times, as we have hinted, when speech is futile. The late Editor of this journal was more than an impersonal writer: he was a near and dear friend to many of the readers and contributors of these columns, and that is one reason the more why there is no need to discourse here upon his amiable qualities. But if other proof were wanting of the esteem and good opinion in which he was held, the spontaneous offers of assistance that have come from all quarters at this moment of trial amply proclaim the fact. In another column a short notice of our late friend and Editor will be found.

TO OUR READERS.

With regard to the future of this journal, it will be for our readers themselves to judge whether the high tone and unflagging spirit with which it has been conducted these many years may not well be maintained by means of the generous co-operation that has already been freely offered, and the earnest endeavours of those to whom the practical guidance of the Photographic News will be entrusted. Suffice it to say that, for the present, at any rate, many friends, banded together by the amiable and attractive qualities of him who is no more, charge themselves with the responsibility of upholding the high character of this journal, and of rendering it in the future worthy of that success which has conspicuously attended it in the past.

THE LATE MR. GEORGE WHARTON SIMPSON.

Mr. George Wharton Simpson, the proprietor and editor of this journal, died suddenly at his residence, Rose Lawn, Catford Bridge, Kent, on Thursday morning, the 15th inst. His life, for many years past, had been devoted to the study of photography and its literature, and the history of the Photographic News is practically that of the deceased gentleman. Born in 1825, he was from his youth a journalist, and made his first step in literature by assuming the editorship of the *Darlington and Stockton Times*. At one time there was an inclination on his part to devote himself to fiction, the success of some little sketches he wrote—one prize story accepted by Messrs. Cassell and Co. in particular—being thoroughly assured; but, moving up to London, the more serious branches of literature attracted his attention. Entertaining early a predilection for the photographic art, he was invited to prepare a small manual on the subject; and this fact it was, more particularly, that led to his connection with the Photographic News. In 1860 he became at once part proprietor and editor of the News, which was raised in his hands to the dignity of a high-class weekly paper of extensive circulation. He became sole proprietor in 1868.

Mr. Wharton Simpson was the author of many well known works connected with photography. The Year-Book of Photography is probably the most important of all, of which an edition has annually appeared since 1859. "On the Production of Photographs in Pigments" is the title of a historical and practical treatise of carbon printing published in 1867, which is of value to this day; nor must we omit to mention an important contribution to the history of the photographic art published in the *British Quarterly Review*.

As a successful experimentalist, he has left his mark. He early predicted a great future for collodion, and worked for many years to improve this material as a vehicle for silver salts. About 1857 he undertook an exhaustive research upon collodions sensitized with bromine salts, and strongly advocated the use of these in conjunction with iron development, as against iodized collodion with pyrogallic development. In later years he brought forward the well-known collodio-chloride process, or Simpsontype, as it has been called in America. The collodio-chloride process may be termed the most permanent silver printing process we have, since the collodion film permits of more thorough washing than the albumen film. Strange to say, although the Photographic Society awarded its silver medal to Mr. Simpson for the work, it was in Germany, France, and America where the process found most favour, and where collodio-chloride paper was generally manufactured. Finally, Mr. Simpson, we believe, enjoyed the reputation of being the only Englishman who has produced colour by photographic printing. In experimenting with his collodio-chloride, he found one day that a portion of the material covered with ruby glass had become red under the action of the sun, the explanation no doubt being that the chloride in suspension had been changed by light to the violet sub-chloride, which had reproduced the tint of the glass above. The colours produced in photography by Niepce de St. Victor were secured, it is well known, by a similar use of what has been termed, for want of a better name, the violet sub-chloride of silver.

Mr. Wharton Simpson has served as Vice-President of the Photographic Society, and of the South London Photographic Society since its commencement, and his ability, both in the world of literature and photography, placed him in a prominent public position for many years past.

POITEVIN'S NEW PROCESS.

It is pleasant to meet an old friend, and pleasanter still if he brings you good news. M. Poitevin is that good friend, and he steps out of his prolonged retirement from the photographic world to present us with a printing process of some value. It may be termed an argento-iron process, for the two metals—silver and iron—play the principal part therein. From a fine art point of view the process may be imperfect, but as a practical printing method it will be found invaluable for many purposes.

M. Poitevin himself is very modest over the subject. He believes, and with truth, that if his name appears associated with any novelty, photographers will take it for granted that the novelty is worthy of attention. No history of photography would be complete without the name of Poitevin, for it is to him that we owe many of the early improvements connected with collotype printing; so that we are not surprised to find the learned French photographer diffident about making a process known for which he does not claim the highest merits, its object being, he says, merely to facilitate photographic printing, by rendering unnecessary the use of a superior quality of paper and other costly materials; and, above all, by dispensing with the delicate operation of fixing by means of sodium hyposulphite. M. Poitevin, it is true, employs a solution of nitrate of silver, but it is only of one per cent. strength.

M. Poitevin has very clearly described the process, so that we have had no difficulty in carrying it out for ourselves. Certain organic salts of iron are acted upon by light, as our readers are well aware, and this fact has been several times made use of by the experimental photographer. The cyanide, or Prussian blue, process, of which the late Sir John Herschell was one of the first to make use, and in which white lines on a blue ground are secured, is, perhaps, the best known of the iron processes; and that of M. Henri Pellet, who has shown us how to invert the order of things, and produce blue lines on a white ground, is another valuable method of the same character. M. Pellet's method, which has been adopted by many engineering firms in this country for the copying of plans and designs, is one of the most practical before the public.

In the case of M. Poitevin's method, raw paper of any description may be employed. We ourselves experimented with three kinds: ordinary cream-laid, Rive paper, and a coarse scribbling paper. The first named was the least successful, owing, we suppose, to the presence therein of mineral matter or some foreign substance inimical to the process; the other papers gave good results. A sheet is brushed over well with a ten per cent. solution of chloride of iron, and dried. The solution of chloride may be applied by sponge, brush, or rag, and the latter we found to answer perfectly well. The liquid is thoroughly well applied, especially if the surface is of a glazed nature. This operation and that of drying take place in light of day. Next the sheet is immersed in ordinary liquor ammonia, this operation, for comfort's sake, being conducted in the open, or, at any rate, in a well ventilated apartment. Again the sheet is dried, and, if taken only to this stage, the paper may be prepared in any quantity in the light. To sensitize, the sheets are treated with a solution of citric acid, and are then hung up in the dark to dry.

The citric acid solution is of thirty to thirty-five per cent. strength, and is applied in the same way as the chloride of iron solution, with brush or cloth. The paper is now sensitive, and when dry is ready to go under a negative. We have, in fact, a paper treated with ammonia-citrate of iron. We selected clichés of two kinds for trial: one of a tabular statement that included only figures in black and white, and the other a picture of the hull of a vessel. The time of printing we found about the same as chloride of silver paper, but the Poitevin paper does not blush in the sun. No image appears until the paper is thrown into a solution containing one per cent. of nitrate of silver, when a picture of a dark sepia tint is not long in making its appearance. A final washing in rain or distilled water is advocated by M. Poitevin, but we employed ordinary spring water with good results.

We tested the finished prints both for silver and iron, and found traces of these metals in the whites; but we are bound to say that it was only after a severe treatment with sulphuretted hydrogen that any appreciable discolouration was observed. The result from No. 1 negative was very agreeable, the table of figures was printed in dark brown, and the print being flat, unlike albumenized paper, the sheet could be preserved without mounting. In a word, it was as good as an ordinary silver print without the defects of glaze and cockling. Our other picture was not quite so successful, and made manifest at once in what the process is at present deficient. But it was a nice picture, for all that, with good half-tones and a matt surface; it resembled a platinotype print more than a silver one. There was proof enough that the process had a future, and we have no doubt a more pleasing result still would have rewarded us if we had adopted M. Poitevin's advice, and taken the picture a step further. He tells us that by dipping the print in a weak solution of ferrocyanide of potassium a beautiful print in blue is obtained. A very dilute solution of chloride of gold will in like manner change the print to a violet colour.

We have here, then, a process to which photographers would do well to turn their attention. In concluding his paper M. Poitevin says: "So far as the photo-chemical reaction is concerned, I think the process is complete; there remains now only the artistic question to be solved: that a solution will be soon discovered by our skilful photographers I hope and believe. I invite them heartily to take up and study the process."

RECENT PROGRESS WITH THE ELECTRIC LIGHT.

The Philadelphia correspondent of the *Times* gave a gloomy account in that paper, the other day, of the recent triumphs of Edison in rendering the electric light an efficient substitute of gas. Similar accounts have, however, arrived from America before, and suggest the necessity of accepting them with a grain of salt. It appears that after fruitlessly trying platinum, iridium, and a number of other substances for the illuminating point, he has at length found the right article in carbonized paper. It seems that he was successful up to a certain point, and then failed. He had made his generator, his regulator, his meter, and his complete electric system, but he lacked the actual medium of emitting the light. Nothing could be got that was satisfactory. Platinum seemed the best, but it was too costly, and its light too dim. Months were spent in hunting for better supplies of platinum, and in endeavouring to make it a successful illuminator. When one day Edison, having used a piece of paper for a light, carelessly rolled the burnt fragments between his fingers, and suddenly thought he would try it as a specimen of carbon. It made a far better light than all the platinum, and had the advantage of being cheaper. He discarded the platinum, and went to work at perfecting the burnt paper, resulting in his present little elongated horseshoe of baked cardboard placed in a vacuum within a small glass globe. His lamp costs about 25c., of which 8c. is expended on two little platinum clamps, which fasten the ends of the cardboard to the wires conveying the electric current. Just what it cost to supply the current could be readily calculated, by estimating the cost of running the steam-engine furnishing the power for the electric generator, and the cost of materials.

Describing the lights, the *Times* correspondent says:—"His lamps were burning when we arrived, and they burnt continuously until our departure, excepting from half-past four to half-past five p.m., when about an hour's

time was taken in putting in a new generator to do the work, which he had just finished, and desired to try. During the daylight we could see the lamps burning, supplied by the first generator, and perceived that the little carbon loop or horseshoe giving the light remained intact. After dark, when the second generator went to work, we saw for three hours the lamps successfully burning as a complete substitute for gas for every purpose for which illumination was necessary at Menlo Park. The gas jets were idle, being put out of use by the steadier and more genial glow of the electric light. We ate our supper by it in the little restaurant that has been established at the Park, and I sat down in Edison's office under two of his lamps attached to a gas bracket, and wrote the rough draft of the telegram sent to the *Times*. In this room a telegraph operator worked in a corner with an Edison lamp in a moveable table-stand illuminating his work. Downstairs his book-keeper was paying off the hands by the aid of two more electric lights on a gas bracket. Out in the roadway in front of the building two street lamps were set up with the Edison light in full operation. In his workshop the engineer was running his engine and a couple of men watching the operation of the new generator by the light of more Edison lamps, while in the laboratory some fifteen of them were giving light for various operations, and downstairs a young man sat at the regulator and, watching another light, by the aid of the galvanometer, kept the flame steady, just as the regulator is worked constantly in the gas-house to adjust the gas pressure, so that it will compensate for turning lights on or off throughout the town. It was between seven and eight o'clock on a dark winter evening, and the electric light had put into disuse both the gas jets and the petroleum lamps that were in profusion around. I visited four dwellings in the village and saw the Edison lamp doing the work of illumination for all household purposes in each of them. In Edison's own house he had at least a dozen of them."

Speaking of the cost the correspondent says:—"My impression from all that I could learn was that, if furnished in any quantity, an amount of electric light equivalent to 1,000ft. of gas could be produced for about 10d., and possibly as low as 7d. Edison ran about sixty lights on Saturday night, in different places at Menlo Park, each equal to a 16-candle gas jet, but as steady as the best argand burner I ever saw, and all burning at the same time. They were all attached to a single circuit, but each lamp could be turned on or off independently. Two of the lamps had been in operation ten days, the others were newer, being attached to the circuit as fast as made. While accidents had happened to several lamps, it is noteworthy that the little carbon horse-shoe was as durable as any part of the lamp, and that all the accidents that did occur came from outside sources, which broke the glass. During all the time I was there nothing happened to any of the lamps, though we tried all kinds of risky experiments with them."

BRIGHT PROSPECTS.

THERE is good news for photographers, if we are to believe the Astronomer-Royal of Scotland. According to the *Daily News*, Professor Piazzi Smyth believes he has discovered that waves of heat come to this country in cycles, and that the cyles are connected with sun-spots. Looking back he finds that the heat waves arrived in 1826, in 1834, in 1846, in 1856, and in 1868. These years are not equal distances apart; but the sun-spot periods are equally irregular, and the minimum of sun-spots has occurred in each case from one to two years before the coming of the hot wave, which is, in fact, due to the re-awakening of the forces which make sun-spots. If, therefore, something like the same order in these phenomena takes place this year, we are on the verge of a heat wave which, according to Professor Smyth's reckoning, will reach its maximum in the middle of next October. This will give us a fine summer, a hot and dry harvest time, and a warm winter.

DESTRUCTION BY FIRE OF MAWSON AND SWAN'S ESTABLISHMENT.

OUR readers will regret to hear that the famous establishment of Messrs. Mawson and Swan, at Newcastle, was destroyed by fire on Saturday night. The loss is estimated at between £15,000 and £20,000, but we understand that it is covered by insurance. Mr. Swan has been good enough to transmit us an account of the disaster, which we append, and our readers will be glad to hear that arrangements have already been made to carry on the business as usual. The presence of large quantities of collodion, as also of ether and alcohol, in laboratories and warehouses account obviously for the virulent character of the conflagration.

The building, which is the property of Messrs. Mawson and Swan, was erected by them only a few years ago, and is considered one of the finest in the town, its frontage being of great architectural beauty, possessing a central portion and two wings, the latter having a Mansard attic storey, with moulded window frames of a circular shape. The building extends back a distance of about sixty feet to the northward in the space between Grey Street on the west, and Pilgrim Street on the east. Behind the front building were extensive warehouses containing a valuable stock of chemical substances, scientific apparatus, photographic appliances, &c.

It appears that a little before five o'clock an assistant named Leithard had occasion to go to a cupboard at the back part of the shop, in order to obtain a bottle of perfume. For this purpose he carried a lighted taper, and on opening the door the bottle of perfume fell on the floor, and, unfortunately, the lighted taper also fell from the assistant's hands among the perfume. In an instant the perfume, which contained a quantity of spirit, burst into a flame, burning the assistant severely. Several persons in the shop, hearing the crash and seeing the flames, ran to his assistance, and extinguished the fire on his clothes. His injuries were, however, deemed to be of so serious a nature that he was at once conveyed to the Infirmary. In the meantime the burning spirits set the flooring on fire, and in less than five minutes the whole of the back part of the shop was enveloped in flames. The fire then rapidly spread to the warehouse, and extended with great rapidity to the upper part of the building, and before a quarter of an hour had elapsed, the flames had spread at the back from room to room, until at last it burst through the roof, lighting up the whole of Mosley Street, Dean Street, and Collingwood Street.

Mr. Swan, the principal owner and manager of the business, was in London at the time of the unfortunate occurrence, and, as might be expected, a telegram was despatched to London requesting him to return home at once. It is understood the occasion of Mr. Swan's visit to London was to obtain the necessary material to light the whole of his premises continuously with the electric light.

The *Newcastle Daily Journal* adds:—

"The fire throughout was, with the exception of flames in the cellar, confined to the back of the premises; and we understand that this, in a great measure, is due to special precautions which were taken in the building of the property. Had it not been for these precautions the whole of the front of the building must certainly have been destroyed; but in spite of the intense heat to which the front part was exposed from the interior, so little damage has it sustained that the firm do not intend to take it down. But in the warehouse the damage done must be very great indeed, not only that caused by the fire, but also by the water. As yet no estimation can be made as to the amount. At seven o'clock the water was literally pour-

ing into the lower shops, and but for the timely removal of their stock, Messrs. Barton and Wells must have suffered greatly. As it was, a large quantity of cloth was ruined with the water, and the shop rendered unserviceable for some time to come. All the offices were flooded, and a large sum must be taken to represent the damage done to the premises through which the hose was carried. The property destroyed is insured in the County Insurance Company; and the stock, which was of the most valuable description, is partially insured in the Yorkshire Insurance Company. There was some salvage; but this was inconsiderable, compared to the property destroyed. For some time Messrs. Mawson and Swan will be unable to occupy the premises; but we are informed that the rebuilding of the warehouses will be commenced as soon as possible; and that until this is accomplished, the business will be carried on at their Pilgrim Street shop, well known as Messrs. Gilpin's establishment."

Correspondence.

ELECTRIC LIGHTING.

Sir,—At the meeting of the Literary and Philosophical Society, January 12th, Mr. C. H. Stearn read a paper in explanation of Swan's patent electric lamp, which he exhibited. For the original invention of this lamp he claimed the priority of application, although Mr. Edison had patented a somewhat similar invention a few days before Mr. Swan's patent was registered.

Having known of Mr. Swan's system of lighting by means of incandescent carbon in vacuo quite a year ago, and having had frequent and continued opportunities of seeing the application, and assisting Mr. Stearn in testing and improving it since last August, I desire to record my testimony in favour of the claim set up by Mr. Stearn for the priority of Mr. Swan's invention.

I was amused some days since at seeing a description of Mr. Edison's lamp, claiming for Mr. Edison that he had actually succeeded by means of apparatus invented by himself in obtaining a vacuum of a millionth of an atmosphere. Surely the experiments of Mr. Crookes and others are now sufficiently well-known to the scientific world to satisfy the most incredulous that they succeeded years ago in obtaining vacua of the twenty millionth of an atmosphere by means of the Sprengel pump, an improvement upon which is adopted in obtaining the vacua in Mr. Swan's patented lamp.—Yours, &c., Garrett J. Barry.

A SUGGESTION.

Dear Sir,—It has occurred to me as quite possible and very easy to photograph the transformation scenes of our London theatres with rapid dry plates. I will give my idea of the way it could be managed, trusting it may prove of service to the profession, as well as to the proprietors and managers of theatres.

The time for exposing would be just before the curtain falls, with some of the Luxograph Company's Actinic Compound burnt with the coloured fires used on the stage, and with a quick lens, which need not be a wide angle, nor much stopped down. I would use a good portrait lens for 10 by 8 or 12 by 10 plates.

Several cameras could be used at the same time with slightly different exposures, and as the trial could be repeated every evening, success, I feel sure, would ultimately follow.

I have had experience enough to know what the Luxograph Company's Actinic Compound will do in a large hall, without the aid of the coloured fires used in these scenes. The body of the theatre being always darkened at this time is a great point in favour of its success. I should be pleased to assist any one wishing to give this a trial.—Yours very truly, George Touhy.

Proceedings of Societies.

Edinburgh Photographic Society.

The first popular meeting of the nineteenth session of this Society was held in Queen Street Hall, on the evening of Wednesday last, January 14th.

The President (Mr. John Lessels) in opening the meeting, congratulated the Society and the Lecturer on the (about) 750 which had gathered to grace their opening night, and in a few fitting words introduced the Lecturer (Mr. W. H. Davies) to the meeting. He proceeded to say:—

"In opening this, our nineteenth popular session, I may be excused for dwelling for a few moments on the immense increase in the membership, if not also of the usefulness of this Society.

"The first of these popular meetings was held in Messrs. Lyon and Turnbull's rooms, George Street, on the 20th November, under the presidency of Mr. (now Dr.) Marwich, Town Clerk of Edinburgh, then and now of Glasgow. We had grown from being a baby society of eight members up to a respectable membership of seventy. For that increase we were indebted to the enthusiasm and push and go of the young members—we were all young then.

"Some of us, including myself, have grown older since that; some, on the other hand, seem to grow younger, and so are able to keep up the necessary *vim* and go needed in a society such as this is, and that can only be kept up by a succession of good office-bearers as well as of members; and when I tell you that our present secretary, Mr. Dobbie, a worthy successor of a long line of gentlemen who have held the same office—when I tell you that he informs me that the present membership is about 400, you will understand at once that we are not only able in these dull times to hold our position, but also have been able to keep improving in our membership, in our status, and, may I say, in our usefulness.

"It has occasionally been hinted by faint-hearted friends that the popular evenings, such as this, were, like the Caucasian, played out. Now the answer to this is the ever-increasing numbers who wish to attend and to see, even despite the bad speaking they are obliged to listen to before that most desirable object be attained. This, I should say, is the best argument that our popular evenings are popular, not only in the restricted, but also in the general sense. There is not a doubt that these meetings form a large part of the expense of carrying on the Society, but, on the other hand, they are, I think, a means of conveying to many of the members and their families an idea of what is going on in this little world of ours, and of at least affording a timely and enjoyable series of evenings during the winter months of a kind likely to extend, certainly not to restrict, that experience, information, and knowledge, which should, and I doubt not does, form the best argument for the upholding of them, in addition to the fact that many—in fact, the large majority—of the members attend no other than these meetings, where, if they see little that is good, they will see less that is evil.

"With these preliminary remarks, we will now approach the subject which has drawn us together this evening.

"Rapid Studies from Nature.

"Instantaneous is the word used on the admission card; but I have thought it better to restrict it to the title 'rapid,' which may include many subjects which are not instantaneous, but yet are sufficiently rapid as out-door studies to come within the ideal formed for the evening's lecture and exhibition.

"Coming, as it does, just a week after Mr. Swan's paper at the ordinary meeting of the Society, the subject was shown to be both interesting and popular, as evidenced by one of the largest—if not the largest—of our usual meetings. I may mention that I did not know what was to be the subject for that meeting when this one was arranged for.

"The shortness of time alone has prevented me bringing before you several of the examples there shown, but we will contrive, I have no doubt, before the end of the session, to bring before you a selecton of those, in many respects, wonderful productions. The question of instantaneity must, however, not be supposed to be either a new thing, or necessarily to belong to the latest medium, which was also one of the earliest—gelatine; and the haloid salt used to produce those rapid pictures, viz, bromide of silver, is as old as the Daguerreotype, which takes us up to the dawn of photography. Thus the

old becomes the new, and the new but repeats the old—in an improved manner, let us hope.

"Instantaneity is, however, after all, but a comparative term, and although the one-thousandth of a second may seem a very short space of time, yet a photograph has been taken in a shorter period than that, and by the present collodion process, too. This was done in the Polytechnic Institution of London many years ago, and in this way a fly-wheel was made to revolve rapidly at a measured rate per second in a darkened room, and while so revolving, a single spark from an electric battery lit it up for an atom of time: the result was a picture with the spokes of the wheel perfectly straight and steady, as if at rest. Thus you have a case in which, given the knowledge of the rapidity of the flash and the rate of speed of the wheel, you can calculate the exact stage of rapidity.

"A more recent example from California I had hoped to have brought before you to-night; but by various circumstances I have been prevented. I allude to those wonderful (for they are wonderful) pictures taken by Mr. Muybridge, of San Francisco, taken while one of the fastest trotting horses in America was at full speed, in twenty-four different views and attitudes, and in each the horse appears as if perfectly steady. I may mention that the general speed of a fast trotting horse is about two and a-half miles a minute.

"I am afraid that few—if any—of those to be shown to-night either can be or have been so rapidly taken; but many of them have not only that quality, but they have a much higher one—that of being extremely artistic—and in this connection I would call the attention of my audience who may not be either photographers or acquainted with the extreme difficulties imposed on the artist who does this kind of work under many disadvantages.

"These are (1st) the instrumental difficulties—*i.e.*, those inherent in the camera, and more especially in the lens, which is rarely suited for the double purpose of rapidity, and at the same time having that area and depth of definition necessary to make up a fine and complete picture at a flash, so to speak. Then there are (2nd) the atmospheric conditions, as of sunshine or light, absence of wind, of haze, and other such preventives of good and successful work; and (3rd) the getting the best of the foregoing conditions combined at that point where the chosen subject is, together with last, not least, the photographer with the ready eye to see, the deft hand to seize the precise moment at which all combine to give the best effect, and thereafter the skill to produce the work from it.

"With the painter this series of processes is avoided, for given the training and capacity of drawing, designing, and painting, a few rapid strokes of a pencil or a brush will fix for ever an effect once seen, and which, when elaborated, may be altered or varied in order to suit the design or the subject chosen. I have taken the liberty to introduce several copies of pictures by known artists, as illustrating this idea, and also showing the more complete character of the artist's effort for which he has to wait and work, even as the photographer has to do; but then he works with more perfect instruments—the eye, the brain, and the hand. I speak not of colour, for all artists admit that depictions on canvas, no matter how perfect, and no matter by whom, come, after all, far short of the ideal of the painter, who can only work, as we do, with materials which cannot do more than represent, and that at a most respectful distance, the glories and beauties of nature. How much more difficult must it be when such subjects are attempted as several of those we have to-night, where action is sought to be represented? The hundred and one subtleties that go to make up even so slight a subject as some you will see, such as the 'End of the Rig,' and others, perfect in many respects as they are, think what they would be with the charm of colour added, and, as an addition, that indefinable feeling or sense of air and atmosphere; but, above all, they have the absence of that ever-shifting panorama of beauty– the sky, with its clouds and its brightness, its grand forms, with their lights and shadows suggestive of the immensities.

"It is true that we are not without examples of this kind of work, but those I have referred to are types of much of what our best amateurs, and some even of our best professionals, believe to be fine or probably the best that can be done in a way; but this is not so: whatever is possible in the highest quality and most perfect kind of photographs, is possible to be represented here on the grander scale, or that which we generally present to you in most cases less, but in some larger, than nature. This leads me to suggest to some of our members of an inventive turn of mind whether it might not be possible to do as was done with many of the pyramid and Cyprus views—that is, to have a scale attached to the transparencies, so that all might have an approximate idea of the size or scale of the objects; for instance, in such cases—and I have many to show to-night—where men, or cattle, horses, or dogs, come in, you have a natural scale which all may read; but this is not so with all subjects, and in such, were it possible to introduce one, it would, I think, be an advantage.

"To much of the rapid landscape work these remarks do not apply, because their most perfect work can be and has been done, as I shall be able to show; but there are two styles of art at least, in which I am afraid we shall not only never shine, but may never succeed in representing even in monochrome. I allude to those historical and imaginative works of the painter and designer which have raised them far above what I am sure photography and photographers can ever be, as the latter must content themselves with representing as best they can the everyday things before them, or catch such effects as nature so bountifully affords, and translate them into the light and shade our art science allows, or as far in that direction as we have yet discovered.

"One more illustration of the almost impossibility of photography, even in its most rapid or instantaneous processes, competing with art, and I am done (I allude to it, seeing that many of the studies we have to exhibit this evening are those of animals). Those magnificent works which have come down to us by such masters as Rubens, Snyders, and others of the Flemish school, and to those of the late Sir Edwin Landseer, of animals in rapid action—bull, boar, bear, or deer hunts, and the thousand and one instances which will be familiar to you all. I might, if I chose, go on quoting from the present time back to that of Phidias (Circa 450 B.C.), but it would be useless; suffice it to say that all who have seen, and few who cultivate or enjoy art have not, must be aware that in instances such as I have mentioned there is a limit that we cannot overleap with all our improvements in processes, our increased rapidity, even to the extent of instantaneity.

"Let us then be content to represent, and that as truly as we can, the scenes and objects among which we move, whether here or in the most distant realms and regions of this earth; in doing so, depend upon it we are acting as a great educational agency, realizing, in fact, to the minds of many who may not have thought before, the wonders and beauties even of the very homely as well as of the grandest and most majestic objects in nature."

The transparencies, numbering over sixty, representing a large variety of subjects, were succinctly described by the lecturer; they embraced almost every phase of rustic life in action, from the cameras of Messrs. Foster, of Coldstream; McGhie, of Glasgow; Messrs. Mathison, Wilson, Milligan, Jackson, and others, together with several from pictures by Gourlay Steell, Esq., R.S.A., animal painter to Her Majesty for Scotland, and several selected groups from the Elgin Marbles, these being exhibited by way of contrast to the photographs from nature. The lantern, which is an extremely powerful one, and was placed at a distance of about sixty feet from the screen, was admirably managed by Mr. Mitchell, assisted by Mr. Forgan.

The proposer of a vote of thanks to the lecturer said he had to congratulate him and the Society on one of the best popular evenings they had ever enjoyed. From first to last it had been a grand success, and he would also add the names of the gentlemen who had managed the lantern, as well as those whose negatives had been so freely placed at the disposal of the Society. This was received with rounds of applause, and the meeting then separated.

The third ordinary meeting of the current session was held in 5, St. Andrew Square, on Wednesday evening, 7th inst., John Lessels, Esq., presiding.

There was an unusually large attendance, many members coming long distances by train. The attraction was a paper by Mr. Swan, of Newcastle, entitled "Illustrations of the Effect of Various Modifications of the Developing Solution in the Development of Dry Plates" (see p. 40).

Mr. Swan was received most cordially, and followed with great interest while he read his paper, which he illustrated by a number of methodically arranged negatives showing the various stages of development indicated, and concluded with practical demonstrations of the chief modes employed.

A number of fine prints were also exhibited, produced from Mr. Swan's plates, by Messrs. Ferranti, and Robinson and

Thompson, of Liverpool; Downey and Mendelssohn, of Newcastle; Green, of Berwick, and others. There was also shown a series of Mr. Law's portraits taken by gas-light on the same plates. The reading of the paper, with its illustrations, occupied the whole evening, necessitating the postponement of discussion.

The following gentlemen were unanimously elected ordinary members of the Society;—Messrs. Thos. C. Jack, Alex. Scott, John Vallance, George Morham, Wm. H. Sharp, W. K. Burton, John Barrie, and Dr. Bedford.

Photographic Society of Vienna.

The ordinary meeting of the Society was held on the 4th of November, Dr. E. Hornig in the chair.

After the routine business of the Society had been transacted, the Chairman informed the meeting that Dr. Eder, in compliance with the wishes of several of the members, had consented to deliver a series of lectures on photographic chemistry, provided that the number of persons promising to attend the course amounted to 15 or 20.

Dr. Hornig expressed himself as highly delighted with this arrangement, and invited the members generally to apply to Dr. Eder himself for further information.

Herr C. Haack entered at some length into a description of the gelatino-bromide of silver process, and demonstrated the preparation of plates. He objected to the use of drying-boxes, where the plates are placed in a horizontal position, but recommended, on the contrary, a dark-room, lighted only by a lamp with a red shade, and heated by a stove in an adjoining apartment, wherein the plates are set vertically to dry on racks. Herr Haack showed a large number of negatives taken on gelatine emulsion dry plates, and proved, with the help of two plates that had received the same exposure, one of which was coated with gelatino-bromide, the other with ordinary wet collodion, how much greater is the sensitiveness of the first-named preparation. He also exhibited transparent positives taken by candle-light, and enlargements made by means of the Scioptieon. This speaker explained that, as a rule, he had employed the pyrogallic developer, but expressed an opinion that the ferrous-oxalate developer, recommended by Dr. Eder in his simplified process, possessed great advantages for those who had hitherto been in the habit of working with the ordinary wet process, on account of the similar appearance of the negatives obtained in this way to those of the latter method. As regards the employment of gelatino-bromide for reproductions of line copies, Herr Haack declared himself as not quite satisfied with the results of the experiments already made, but he fully expected that important improvements would, at no distant date, be introduced into the methods now in use.

Dr. J. M. Eder laid before the meeting two samples of pyroxyline in different stages of decomposition, which he had received in answer to his appeal in the photographic journals. As regards one of these samples, which was found to be in a half fluid or jelly-like condition, the speaker remarked that he had in numerous instances kept for a great length of time specimens of pyroxyline in closed vessels, and had often had occasion to observe signs of decomposition (especially when the specimens had been washed in distilled water)—as, for example, the appearance of nitrous acid fumes, an increasing solubility in water, &c.—yet he had never seen so great a change as in the present instance. He promised to submit the samples exhibited to chemical analysis. He further stated that, in his own experience, decomposition was most quickly set up in pyroxyline kept in closely-stoppered bottles, and much more slowly when wrapped loosely in paper. In general, the substance can be preserved for years without any special precautions being observed; this had been proved by samples of pyroxyline that had been sent to the speaker after having been kept for sixteen or even twenty years.

Photographic Society of France.

At the meeting of this Society on the 5th December, M. Davanne, President of the Executive Council, occupied the chair.

The following formula for a developing solution by M. Darieau, of Marseilles, was submitted to the meeting by M. Perrot-de-Chaumeux:—

Distilled water	100 grams
Saccharo-sulphate of iron	12·50 ,,
Glacial acetic acid	50 drops

With the aid of this solution, M. Darieau asserts he has developed a negative, taken under a good light, in less than a second. The saccharo-sulphate of iron is prepared as follows: dissolve separately 100 grams of sulphate of iron in 100 cub. cents. of boiling water; also 50 grams of sugar-candy in 30 cub. cents. of boiling distilled water; then mix the two, and in the course of a short time the solution will deposit crystals, which must be collected and dried on *white* blotting-paper.

On this subject M. Perrot de Chaumeux remarked that Mr. Law had some years ago pointed out the excellent results obtained with saccharo-sulphate of iron; the present experiments of M. Darican showed that this substance had been too much neglected, probably owing to its not being found in the shops. Its preparation is, however, so simple, and the tendency of all modern improvements is so much in the direction of shortening operations, that the remarks of M. Darieau will probably bring it into favour again. In 1863 M. Kaiser recommended the use of sugar of milk, which, in his opinion, possesses a reducing power that has not been sufficiently studied.

M. Bardy observed that the saccharo-sulphate of iron prepared according to M. Darieau's formula would not be likely to give any special result. He had himself prepared that substance, following the formula with the greatest care, and he had found by a most critical analysis that the consequence of the crystallization is merely to separate the sulphate of iron from the sugar, and that the dried crystals contained only the iron sulphate without a trace of sugar. If, therefore, it be an object to add sugar to the developer, it should be done directly, without having recourse to a useless and troublesome manipulation.

The following note by Mr. A. Gautier on the method of obtaining pure crystallized chlorophyl has been communicated to the Academy, and was read at the present meeting in consequence of its having been shown by MM. Becquerel, Cros, and Ducos du Hauron, that that substance, when added to a sensitive film, enabled the latter to reproduce colours hitherto considered out of the reach of photography.

"To obtain the chlorophyl I take the green leaves of spinach, cress, &c., and pound them in a mortar, adding to the pulp a little carbonate of soda until the liquid is neutralized, and then I submit the whole to strong pressure. The mass thus obtained I digest in alcohol of 55° C., and I again pass it through the press; then I digest it once more in alcohol of 83° C. By this process the chlorophyl is dissolved, along with all the fats, the wax, and the colouring matters. To separate these, the liquid is filtered, and then placed in contact with powdered animal charcoal previously well-washed and raised to a high temperature. At the end of four or five days the liquid will be found to have turned a greenish or brownish yellow, and it will contain all the impurities. It is decanted off, and the charcoal is collected in a tube plugged with cotton-wool, where it is washed with alcohol of 65° C. This liquid takes up the yellow crystallisable substance which is always found to accompany chlorophyl, and which seems to have some intimate relation with it. On the charcoal thus deprived of the yellow substance, or containing mere traces of it, there is poured anhydrous ether, or, better still, light petroleum oil, which does not dissolve the yellow substance. Those solvents take up the chlorophyl, and yield a deep green liquid, from which the latter can be crystallized out by slow evaporation in the dark."

M. Aime Girard communicated to the Society the following note on the employment of hydrocellulose in preparing photographic pyroxyline:—"Whenever cellulose ($C_{12}H_{10}O_{10}$), in any form, is submitted to the action of concentrated acids, it is dissolved, and by taking up two equivalents of water, is transformed into glucose ($C_{12}H_{12}O_{12}$). But previous to this saccharification, an intermediate stage may be observed, where only one equivalent of water is taken up, and a new compound is formed to which the formula $C_{12}H_{11}O_{11}$ is attributed. This compound, to which I have given the name of *hydrocellulose*, is not soluble in the acids, and provided that care be taken in the manipulation, it still possesses its original external form; but so soon as it is touched it will be found to have lost all its power of cohesion, and to fall away to an almost impalpable powder. Hydrocellulose possesses a number of chemical properties of its own, but it keeps also some of the properties belonging to ordinary cellulose. Among the latter is its capability of being nitrified by a mixture of nitric and sulphuric acids, and of being by this means transformed into either explosive or soluble pyroxyline. In this way we can prepare either explosive or soluble pyroxyline in the state of a fine powder. The manner of preparing it is precisely similar to that of preparing pyroxyline from cellulose, but

in this case the product, when rubbed in a mortar, is at once reduced to an exceedingly fine powder. This powder, dissolved in a mixture of alcohol and ether, gives a collodion whose value to photographers it will be most interesting to ascertain. The only difficulty, therefore, is the production of the hydrocellulose. This substance can be obtained from any form of cellulose, but the best for the purpose will be found to be raw cotton in tufts. For effecting the conversion, there are three ways—(1) immersion for several hours in concentrated acids; (2) exposure to the vapours of the hydracids, as hydrochloric or hydrofluoric acid; (3) absorption by a weak acid, and then desiccation. Of these three methods, the last-named is undoubtedly the most convenient. Take, then, some fine tufted cotton, and immerse it in a 3 per cent. solution of nitric acid; remove it immediately, drain it, and put it in a cloth, and wring it well; then pull it out and leave it to dry. If you are pressed for time, you may dry it on a stove at a temperature of 40° to 50°; a few hours will in that case suffice to render the cotton quite friable, and its transformation into hydrocellulose will be complete. But care must be taken not to raise the temperature above the point indicated, or the substance will turn yellow and decompose. When, however, time is no object, let the cotton be well pulled asunder, and then be allowed to dry slowly on a plate in the laboratory or studio at a temperature of from 15° to 20°. By this, the more preferable method, the cotton will, in a few weeks, be converted into hydrocellulose, which, though perfectly friable, will preserve sufficiently its fibrous condition to be easily acted on by the acids that are to nitrify it.

Talk in the Studio.

Photographers' Benevolent Association.—The annual general meeting of this Association will be held at 160a, Aldersgate Street, on Wednesday, 28th inst., the chair to be taken at 8 p.m. by W. S. Bird, Esq. Members are particularly requested to attend, and photographers generally are invited.

Moulding Mixture for Gelatine Photo-Plates.—For moulding the gelatine relief Leipold's mixture may be employed, and by the exercise of care very perfect results may be obtained. The following receipt for Leipold's mixture is taken from Husnik's *Heliographie*:—Seventy parts of bitumen are melted at a moderate heat, and to the melted bitumen there are added the following, each being melted previously:—

Spermaceti	425
Stearine	200
White wax	170

All these being well incorporated, 70 parts of finely ground blacklead are stirred in. The plate to be moulded being thoroughly swelled, is removed from the water, dried with a cloth, and gradually raised to as high a temperature as it will bear without injury to any details of the device, this being generally about 35° C. A metal border being now fixed round the edges, the above composition, which ought not to be at a higher temperature than 40° C., is poured on, the composition being allowed to flow over the plate in one continuous wave. The thickness of the layer of composition may vary from half-an-inch to one inch in thickness, according to the size of the plate, and no attempt should be made to remove the cast until the next day, when it will generally separate with great ease. The mould is next made conducting with bronze powder, and electrotyped. The first electrotype cast obtained should be very slightly oiled, and a second cast made in it will be the required printing plate.—*Scientific American.*

Death from an Electric Shock.—An accident of an extraordinary nature occurred last night at the Holte Theatre, Aston, a suburb of Birmingham. The stage is lighted by two electric lights, and when the candles are not burning two brass connections used for the purpose of crossing the current are hung up over the orchestra. After the performance of the pantomime, Mr. Bruno, the euphonium player, was leaving with the other members of the band, when, presumably out of curiosity, he caught hold of the two brass connections referred to; the man in charge called out to him with the object of warning him of the danger he was incurring. The warning, however, came too late; Mr. Bruno received the full shock of the electric current, generated by a powerful battery which supplies the whole of the lamps in the building and grounds. It is said that the candles not being then burning, Mr. Bruno was unable to disengage himself, and pulled the wire down. The shock rendered him insensible. A medical man was at once sent for and restoratives were applied, but Mr. Bruno died in about forty minutes afterwards.

To Correspondents.

*** We regret to say that, owing to the lamented death of the late Editor, the letters of several correspondents have been mislaid. Will they kindly repeat queries to the Editor, Office of the Photographic News, 5, Castle Street, Holborn, E.C.?

J. Royce.—We do not know if it is a commercial article, but try Hopkin and Williams, Cross Street, Hatton Garden, or any good manufacturing chemist.

Leo.—Referring to your second query, the grey deposit you mention is grey metallic silver. Wash carefully, and then filter or decant, whichever you please—the latter operation is best—allowing time for the silver to deposit itself, and then pouring off the liquid. Place the powder on filter paper to dry, and then you may dissolve the former in nitric acid. Do this in the open air, as the fumes from the acid are very poisonous. The nitrate will crystallize out, but the crystals will require dissolving again in water, the solution evaporated, and crystals reformed. In fact, the dissolving of silver in nitric acid and production of good nitrate is both dangerous and difficult, and therefore scarcely worth while under ordinary circumstances. An answer to question No. 1 next week.

Northumberland. Bach.—In our next.

P. M. Laws.—Thanks for your communication. We shall consider it next week.

Nemo.—Common salt or hydrochloric acid added to your waste liquids will precipitate most of the silver, and it would be scarcely worth while doing any more. But we will send you other methods if you like. Remember that all your deposit is not silver, so do not set too high a value on it. There will be no doubt much foreign matter mixed with it, but a respectable house will give you full value. Other queries in next.

Fred has been printing on linen, and wants to know how to remove silver stains without rotting the fabric. There is no need whatever for injuring the linen. Dissolve a few crystals of iodine in a solution of iodide of potassium—both these are probably at hand—and brush the solution into the stain to be removed. Subsequent treatment with hyposulphite solution will at once remove the stains. Only, care must be taken not to touch any part of the image to be preserved with the iodine solution, as the former will infallibly suffer. Pin a piece of paper over the picture part before going to work.

L. L.—You have no light at the bottom of your picture. If you cannot admit more, raise the dais on which you place the sitter, or—but this plan is not so good—try what you can do with a mirror. You must get rid of that darkness below; otherwise the portrait is good.

Gelatine.—We will ask Captain Abney. His address, by the way, is 3, St. Alban's Road, S.W.

Verax.—You are quite right, but you must remember that we all get cleverer as we grow in age and experience. The French love proverb, *Si Jeunesse savait, si Altesse pouvait*, is true in other things besides the gentle passion.

Workshop.—You can deposit from the silver solution by the aid of metal plates, say copper, but you would do better to precipitate the silver in the form of chloride. See answer above.

A. Ford.—The Year-Book is out, and shall be sent. You have probably, by this time, heard of the death of the late esteemed Editor; hence the delay.

Christian.—The platinotype prints are very nice, but too small to admit of much criticism. There can be little doubt that they are very durable, and in the case of certain classes of negatives we like the result better than silver. The engraving book that you put such stress on is good for plain portraits, no doubt, but it is sometimes too cold to please.

A. Ward.—The yellowness is due to imperfect fixing; wash more in future, and do not use the water too cold.

Malling.—We prefer No. 1; in the others the pose is too stiff. If you want to succeed in portraiture, study some of the more successful pictures you see, and note how the models are posed. The work is clean

Several correspondents in our next.

The Photographic News, January 30, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photography at the Royal Society—Photography at the Tay Bridge—Photography and the Electric Light.

Photography at the Royal Society.—It is not often that photography occupies anything but a second place at the Royal Society, and our big-wigs are always quite ready to use it to help their investigations on other sciences; but they seldom bestow a thought upon making any improvements in photography itself—in fact, they are, as a rule, profoundly ignorant of anything about it, except the merely base mechanical part. What a godsend these mechanical gelatine plates are to them! For a wonder, however, photography has had an honour paid to it. Captain Abney, who, we believe, was elected to the Royal Society, in a great measure, on account of his photographic knowledge, has just delivered the Bakerian lecture on the photographic method of mapping the red and dark rays of the spectrum. From what he said, it is to be gathered this species of photography has taken him five years to elaborate, and at last he has been successful; he has shown the Royal Society that rays which are usually supposed to be heat rays are as actually chemical as those which photographers usually employ. It is almost a pity that Captain Abney should have wasted such a lecture on the Royal Society, which can scarcely know as much about it as the members of the Photographic Society, and, unless he gives the latter a *réchauffé* of his lecture, photographers won't be much wiser as regards his process than they are at present for another eight or nine months; since the Bakerian lecture is published in the *Philosophical Transactions*, a ponderous and valuable publication, but very dilatory in its appearance. Another striking feature of the lecture was that it was a thoroughly Christmas performance; there were a screen and a magic lantern brought into the lecture room, and the room was darkened. This last was an excellent device, for as the slides were by no means of a trip-to-the-Holy-Land character, but merely transparencies of spectrum photographs, it enabled the Fellows to enjoy themselves with their eyes shut. By the way, what will happen when this august body changes its time of meeting from half-past eight to four o'clock, as it is rumoured it will do after Easter? These lantern exhibitions will be difficult. But to be serious, the lecture was a success, and Captain Abney and photography are to be congratulated on having had an honour paid to them.

Photography at the Tay Bridge.—In "Photography In and Out of the Studio," a fortnight ago, it was pointed out that the fallen part of the structure of the Tay Bridge was to be photographed whilst in the river. Since then it has turned out that such a plan is impossible, as the water is so muddy that no picture could possibly be produced. There is no doubt that this is a great misfortune, as much information might have been gained if photographs could have been taken. The problem of submarine photography may or may not have been solved practically. It is worth while pointing out that it would never do to allow any ordinary lens to be in contact with the water, as the focus would be so much lengthened that a monster camera would have to be constructed to use it. An ingenious friend of ours proposes to immerse the camera in a hermetically-sealed box with a glass side, and to make exposure by means of an electrical shutter. By adopting this plan it would be quite possible to secure a photograph if the water was sufficiently transparent, provided, of course, the box was properly guided so that the lens pointed in the right direction. When this subject of the Tay Bridge was mentioned before, attention was called to the use that the engineering world made of photography as a mode of progress in work. At one time, we remember, on most Government works, executed by the War Department, the same system was adopted. For instance, during the construction of the Castle Hill Fort at Dover, progress plans were abolished, and photographs entirely relied on by the Inspector-General of Works, to give him an idea of the rate at which the military working parties were proceeding. We came across some of these at a friend's house the other day, and were surprised to see the good state of preservation of the prints, as they were printed in silver. "Ah!" said our friend, who is a veteran in the art, and had a great deal to do with the printing, "you see, we toned and fixed, perhaps, but half-a-dozen prints at a time, and washed well by changing the water in a dish; none of your running taps for me! I like a good deep dish, a sheet of glass, and a fine sponge, and then I'll warrant that silver prints won't fade." Nowadays the War Office send out all their record plans printed in carbon, and these certainly must be permanent. The photographic department of the War Office at Woolwich were very early, if not the earliest, in adopting this process on anything like an extensive scale, and they seem never to have swerved from their allegiance to it, through evil and good report, though it must be confessed the latter has predominated.

Photography and the Electric Light.—At Chatham the photographic staff are never much behind the times; in fact, the public are to be congratulated upon the very prominent position they take up in regard to trying anything of a novelty. The Royal Engineer Committee have recently been trying the various dynamo-magnetic machines used for generating the electric light, and the aid of photography has been largely called into use. The light, as all know, comes from the points of graphite rods, only a small area of which are rendered white hot. When the light was measured in the photometer it was found that considerable variation in its power took place in very short intervals of time, and the reason of this was not always very apparent. By taking photographs of the carbon points by their own light in two positions at right angles to one another whenever the photometer was read, the Committee were enabled to find that the variation in light was generally due to a greater or less area of the ends of these rods being heated, or from the point of one rod shielding the light from the point of the other. These photographs are permanent records of the state of the light at any particular time, and can be compared with those from different machines. At his London Institution lecture, Capt. Abney referred to the electric light, and stated that probably the amount of red light in every square inch of hot carbon was about equal to the red light emitted by 40,000 candles. This is an enormous quantity to think of as being compressed into such a small space. It must, however, be remembered that the area of the hot point is less than an inch with any machine tried up till now—if we say that a quarter-inch is a fair average we shall not be far wrong—but even that means an enormous quantity of light, and most of it of that kind which is useful to the photographer. We are told, however, that even this immense store of possible light is not so efficacious as sunlight, and when we compare bright sunlight with the electric light, we can at once see in what the difference consists, the electric light being decidedly yellower, or, we may say more correctly, greener than the sunlight; but, on the other hand, Professor Stokes has shown that the invisible but still actinic rays are much more abundant in the former than in the latter. Vanderweyde utilizes the electric light for portraiture, and it remains to be seen if it cannot be practically employed for the economic production of silver or carbon prints.

At Home.

MESSRS. ELLIOTT AND FRY AT BAKER STREET.

THERE is a comfortable look about the Talbotype Gallery in Baker Street, at once reassuring to the visitor. If we are to suppose that sitters are for the most part in an uneasy, not to say excited, state of mind when they enter a studio, there is much in the establishment of Messrs. Elliott and Fry to allay such feeling. There are no reception rooms, in the usual acceptation of the term. The visitor walks upstairs from the vestibule, and finds himself in a gallery of paintings and photographs. The pictures, too, are of such a character as at once to attract attention. Here is the painting that brought Hubert Herkomer his gold medal at the Paris Exhibition, and had very much to do with securing him the coveted A.R.A., "The Last Muster," a scene at Chelsea Hospital. Another painting, equally fine, if smaller, "Im Walde," by the same artist, also graces the walls of the first gallery, with other fine productions; while as we progress through the establishment other no less worthy pictures meet the eye. Mr. Fry, who courteously acts as cicerone, is evidently a great lover of the young Scotch school, for we meet, also, with some fine sea studies of Colin Hunter, Peter McNab, and others.

It is only when we leave the first gallery and proceed to the second and third, that we come among photographs. It is nearly all large work. There are some fine carbon prints upon opal or porcelain, fifteen by twelve and smaller, not only more varied in tone than collodion transfers, but naturally more permanent. Enlargements in carbon of Lord Chelmsford "in his fighting dress," a sort of Norfolk jacket; and next to him two other good pictures, the one vigorous and forcible, the other soft and harmonious to a degree, representing the brave and the fair—Evelyn Wood and Eveleen Rayne. "We try to show what photography can do in vieing with painting in the production of large artistic portraits," said Mr. Fry; and we think photographers would run portrait painters hard if they all succeeded as well as the eminent Baker Street firm. There is a striking portrait of the violinist Wilhelmj—or, as the British public choose to call him, William J.—and the last picture taken in England, genial and bright, of the Prince Imperial in evening dress. If an enlargement is to be made, Mr. Fry prefers, if possible, to secure a cabinet picture in lieu of a carte.

We will go upstairs. "We shall write of no secrets, because you will not tell us any," was our remark, to which Mr. Fry rejoined that we were welcome to see every detail of the establishment without reserve. Shall we inquire terms at the little mahogany counter before we proceed to the studio. The brass rail and busy clerks behind it suggest a bank, and we will hope it is as good as one to the proprietors. A guinea is the stipulated fee, and in these days, when half that sum is charged at any fashionable theatre in town for a stall, we think it exceedingly reasonable. To judge from what one sees, having your portrait taken is deemed by many an amusement *à la mode*, and there can be little doubt that ladies at the West End will pass an hour in a studio *pour se distraire*. The guinea entitles the sitter to a dozen and a-half cartes or six cabinets. There is a clause about children: "Children under eight are charged half"—so the circular says, and we make a point of the statement, because Messrs. Elliott and Fry are, we believe, the first who have had the courage to make the announcement—"are charged half-a-guinea extra for the first set."

The studios are three in number: one, the smallest, is well adapted for vignettes, the others are of larger size. There was everything of the best downstairs, so we naturally supposed there would have been a north light studio. But Messrs. Elliott and Fry did not build Baker Street; they had to take it as they found it. Their light is easterly. There is not only top side-light, but actually top light, but the latter, Mr. Fry assured us, was never used in taking gentlemen with bald heads. It is needless to say that every means of shutting off the light is at hand, together with what might be termed palm-leaf screens, which may be stood anywhere. Of backgrounds there were twenty-six in one studio, and notwithstanding the experience already acquired in their preparation, there were, as a rule, two backgrounds rejected for every one kept. A fine Windsor Park picture—painted in distemper, of course—with a soft shadow falling from the trees in mid distance, was a successful example of a background.

The main feature of the studios was an elongated canopy stretched over the cameras. This canopy was no less than twelve feet long in one of the studios, so that the photographer looked through a sort of tunnel of this magnitude at his sitter. Every one has, of course, employed means for shading the camera, but we have never seen it carried to such an extent, nor carried out so successfully.

The rule of the establishment is to keep the sitter the shortest possible time in the glass room. Ten minutes, and sometimes five, suffice. "You cannot have secured a good portrait, for I was only taken twice during the few moments I was in the glass room—sometimes they take ten or fifteen of me," is not unfrequently the remark made to Mr. Fry, who prefers to get his sitters thoroughly at ease before they go into the studio at all. His dressing rooms are fitted up especially to this end; we went into seven of them, and they were all hung round with paintings, without a single photograph to remind the victim of what he shortly would come to. The rooms were admirably appointed—that goes without saying—but what will the reader say when he hears that gems by David Cox, Birkett Foster, J. D. Watson, and other celebrities adorn the walls in profusion? We should not like to say the sum at which the paintings in the Talbotype Gallery are insured for, lest we may be taxed with exaggeration, but we have said enough to show that they are of considerable value.

Cabinet pictures are evidently still the favourite *format* here, but the promenade is making way slowly and surely. At first it was proposed to call it the "Court portrait," but it is not always in this world as "man proposes." The promenade, unmounted, measures seven and three-quarters by three and three-quarters, and is mounted on cards supplied by Marion, having dark margins and gold bevelled edges. Albums are already being made for the promenade, and such portraits should, if mounted, panel-like, three in a page, make a handsome show.

The negative rooms afford subject for more wonder. There are four rooms stored with them, and, strange to say, not packed in paper, but loose and open in grooves. No special care in respect to heat or damp is taken, and the negatives do not suffer. Rising of the film or worm-marks are unknown, for Mr. Fry thinks that if negatives are properly varnished they run no risk. Yellow shellac varnish is employed.

The printing is done at a branch establishment at Barnet, where both silver and carbon work is carried on. Retouching is, of course, resorted to when necessary, and is for the most part carried out with a lead pencil upon the film. We should not like to say how many the *personnel* of the establishment musters, but they include several foreign artists of considerable ability.

Gelatine plates are already well known here in the studio, and the difficulties of development are now things of the past. To stop the light of his dark rooms, Mr. Fry has found that paper saturated with uranium, and treated to a single coating of boiled oil, sufficiently protects the film during development, and he has no difficulty in securing pictures with one-tenth of the exposure given to a wet plate.

As everybody knows, Messrs. Elliott and Fry are extensive publishers, and this department is under the care of

Mr. Martin, arranged in very systematic form. We have no space, unfortunately, to dwell upon the business-like way in which portraits of lovely women and eminent men are docketed and arranged, and despatched to all parts of the globe. It is only left for us to thank Messrs. Elliott and Fry for the ready permission accorded us of visiting their renowned establishment, and to hope that our readers may glean something to their benefit from our hasty notes.

ON A NEW ACTINOMETER.

BY LEON WARNERKE.*

The actinometer which I have recently constructed, and which I have to describe, is based on the phenomenon of phosphorescence, of which, as it is not generally known, I intend to give a very short outline before describing the apparatus.

Among the substances constituting our globe, there are a great many possessing the property of being luminous after being subjected to the action of light, heat, friction, or electricity. This property is called phosphorescence. Since the photometer depends on the first, I intend to confine my attention to the phosphorescence produced by the action of light.

The first historical record of this phenomenon dates back as far as the year 1602 or 1603, and, like other chemical discoveries of that age, was accidental. A shoemaker of Bologna expecting to extract precious metal from it, submitted some barium sulphate to heat, and, as a result, obtained the phosphorescent sulphide. It was also known in very early ages, that certain precious stones possessed the property of being luminous in the dark, after previous exposure to the light.

Barium sulphide, and calcium sulphide, prepared according to the system indicated by two alchemists, were known as Bologna phosphorus and Canton phosphorus. In our own time more attention was bestowed on this highly interesting subject, by the leading contemporary *savants*, among whom we find also the name of a member of our Society, Mr. Pearsall.

M. E. Becquerel, who made the most important and extensive investigations, found that almost every substance is capable of becoming luminous after preliminary exposure to the light; but this luminosity is of very different persistence, varying from 1-5,000 of a second to thirty hours. The observations ot these short periods were made by means of the phosphoroscope, an apparatus designed for the purpose.

Substances possessing the most persistent phosphorescence, are sulphides of calcium, barium, strontium, and zinc. Not every specimen of these sulphides is, however, phosphorescent, but they must be prepared under special conditions, and although the manipulations are not apparently difficult, success is quite an exception.

The light emitted by a phosphorescent body depends on its chemical and physical property, but not on the quality of light acting on it, and can be of every colour of the spectrum: thus barium sulphide gives more generally yellow and red phosphorescence; strontium and zinc, blue and green; calcium, all colours, according to the temperature and texture of the preparation.

If the solar spectrum be projected on the phosphorescent body, it will be observed that only the most refrangible part excites phosphorescence, extending far beyond the visible portion. The line F becomes luminous, but with the colour proper to the substance investigated. During exposure to the light of the spectrum, all the invisible ultra-violet parts beyond the line H become visible, with all the dark lines. The red end of the spectrum has no exciting action. If the phosphorescent surface, before exposure to the spectrum, be previously partly exposed to the diffused light, it will be noticed that the red end of the spectrum causes the extinction of light excited by the exposure to the diffused light.

The maximum of action varies for every substance, whilst some possess two maxima. For any given substance the intensity of the light emitted is in exact proportion to the intensity of the light acting on it within the limits of refrangibility indicated; very short exposure is sufficient to fully excite phosphorescence; in fact, the electric spark is able fully to excite phosphorescence, notwithstanding its almost instantaneous rapidity.

When a phosphorescent substance becomes luminous through the action of light, this luminosity possesses a persistence varying with different preparations. The rapidity of diminution of the luminosity is not in proportion to the original intensity. It is greater in high than in low temperatures; greater during the first few seconds after insolation, than later.

Phosphorescent luminosity is not accompanied with any chemical action. It takes place in vacuo, in the air, and in the gases. It can be excited and extinguished any number of times, provided the luminous mineral be protected from the action of moisture and carbonic acid. It loses luminosity when acted on by water, from which we may gather that water dissolves the luminous substance; the residue obtained after evaporation is, however, not luminous. Luminosity is also destroyed by fine pulverisation in a mortar; and for these two reasons I failed to obtain a luminous image by the powder process. Extinction of luminosity can be effected by interposing transparent screens of suitable material between the sourse of light and the luminous phosphorescent surface. Glass or other transparent media, coloured red, orange, or green, as well as the solution of sulphate of quinine and creosote, are effective.

All the above enumerated properties of phosphorescent minerals naturally suggest the idea of utilising them for actinometrical purposes. Indeed, if a phosphorescent surface be exposed for a short time to the action of light, it is affected exactly by that constituent part of it which we want to measure, viz., the actinic part; and the light emitted is persistent enough to enable us to measure its intensity, and this intensity is proportionate to the intensity of the light to which it was exposed. Again if, after the observation is made, luminosity still is persistent, it can be extinguished as easily as it was originally excited.

(*To be continued.*)

* Read before the Photographic Society of Great Britain.

ILLUSTRATIONS OF THE EFFECT OF VARIOUS MODIFICATIONS OF THE DEVELOPING SOLUTION IN THE DEVELOPMENT OF DRY PLATES

BY J. W. SWAN.*

In the series No. 1, I have used three different strengths of pyrogallic acid, namely, four grains to the ounce, two grains to the ounce, and one grain to the ounce. These different solutions have all been diluted one-half by admixture with equal proportions of the ammonia and bromide solution. One of the first steps I took on commencing to work with ammoniacal pyrogallic acid was to discard, or all but discard, the dropping bottle, and to so adjust the strengths of the two solutions to be used that I could readily produce a normal developing solution by mixing two solutions in equal quantities.

The pyrogallic acid solutions I have mentioned used in this way become, therefore, reduced one-half of their original strength; that is, the four-grain solution gives in the developing mixture two grains to each ounce, the two-grain solution one grain, and the one-grain solution half-a-grain. I have used these strengths in order to show two extremes

* Continued from page 41.

and a medium. You will see when you come to examine the negatives that the one-grain solution gives a negative which, if it errs, errs on the side of weakness; that the four-grain solution errs in the opposite direction; while the two-grain gives a quality just midway between the other two, *under the same conditions*, mark you; for by *varying the conditions* these differences may not hold good. You may, for example, by allowing the weak pyro. (say the one-grain solution) to act longer than the two-grain solution produce the same amount of strength within certain limits with the weak solution acting for a longer time as with the stronger solution acting for a shorter time. This point is also illustrated by the series, for each of the different mixtures has been used to develop three plates, and each plate has been allowed to develop for a different length of time, namely, two minutes, three minutes, and six minutes.

Here is another series, No. 2, which illustrates the effect of different proportions of bromide in the developing mixture, all other conditions remaining constant. Here you will see a very interesting fact, well known in a general way, but here brought clearly into view, namely, that development is greatly retarded by the presence of a large proportion of bromide, unless this be counteracted by the presence of a correspondingly large proportion of alkali.

It is not so much the *quantity* of bromide in a given quantity of developing mixture as the *relative* quantity to ammonia or other alkali that determines the final effect. It is not, you will observe, that the sensitiveness of the plate is much depressed as that the rate of development is greatly retarded, and the images rendered light in colour and extremely thin. It has the qualities of an old-fashioned glass positive, but even in the shadowy images shown, where a very great excess of bromide has been used, there is abundant detail in the shades in the case of the plate allowed to develop ten minutes. This series illustrates the power which bromide, properly used, gives of compensating for under or over-exposure. By varying the strength of the pyro., all other circumstances being equal, you can vary the strength of the image to any extent. By varying the proportion of bromide relatively to ammonia you can compensate for an error of exposure.

Here, in series 3, is a direct illustration of how this may be done. Here are three plates—one much under-exposed, one much over-exposed, and one exposed for the right time. The relative times of exposure are as one, two, and six, and they are so treated as to give very nearly equally good negatives. No. 2 was developed with what I will call the "normal mixture," consisting of a pyrogallic acid solution of two grains in each ounce of water, and a solution of bromide and ammonia containing four grains of bromide and six grains of ammonia in each ounce of water. These solutions were used in equal proportions in the case of negative No. 2; that is to say, it had normal exposure, and was developed by means of the normal mixture of pyrogallic acid solution and ammonia and bromide solution. In the case of negative No. 1, the under-exposed plate, the same solutions were used, but twice as much of the bromide of ammonium solution as of the pyro. was used; while, in the case of No. 3 plate, which was over-exposed, the normal mixture, the same as that employed for negative No. 2, was used, but with a slight addition of extra bromide.

It is a great point in favour of those plates that so great latitude in the time of exposure is allowable. Differences of exposure that would have been utter ruin to one or other of two wet collodion plates, would, in the case of bromide of silver plates properly treated, give you two almost equally good negatives, even without any special adaptation of the developing mixture to compensate for the differences of exposure, while with suitable adaptation negatives, exposed for widely-different times, may be so developed as to be absolutely equal.

The one drawback of ferrous oxalate is that there is not quite the same latitude for under- and over-exposure; but for certain purposes it is by far superior to alkaline pyrogallic acid. For transparencies printed by gaslight I should say it is inferior. Whenever a *very* clean and *dense* image is required ferrous oxalate has the advantage over alkaline. I do not mean that a very dense image always results from the use of ferrous oxalate; that would be far from true, for I have negatives here of extreme delicacy developed by this means. Here are some prints produced by Ferranti, of Liverpool, from ferrous oxalate-developed negatives which may clearly indicate that ferrous oxalate, in the hands of a skilful manipulator, is quite equal to the products of negatives possessing all desirable delicacy.

Some difference of opinion has been expressed as to the comparative energy of ferrous oxalate and alkaline pyro., some holding that a weaker initial impression was developable by means of the one agent, and others with the other. I am inclined to think that there is no difference between them in this respect, but that they are precisely equivalent to each other. I am supported in this view both by theory and experiment. Consider for a moment what a developer has to do. It is required of the developer to effect a decomposition of bromide of silver in those parts only where there is a predisposition to decomposition caused by the impact of light. There is a certain resistance in the most sensitive plates of bromide of silver to decomposition. Light contributes a certain quota of power towards the overcoming of this resistance, and the developing agent contributes the remaining part. Decomposition, therefore, is produced by the joint action of two powers. Let me illustrate this by an analogy.

Suppose the bromide is like the beam of a balance, with a certain preponderance to one side, representing the degree of the stability of the bromide.

Suppose that the impact of light is equivalent to a certain weight on the other side of the beam, but insufficient of itself to overbalance the beam—that is, to disturb stability. Suppose, further, that the developing solution is also a weight of a certain power tending to upset the beam, but of itself not quite equal to upsetting it, and suppose, moreover, that these two weights or powers united—namely, the power of the light and developer—are weights which, when united, *are* able to upset the balance, we have when these two powers act together the disturbance of the *status quo* which represents development. To make the illustration plainer, let us suppose the inertia or resistance to decomposition of the bromide to be equal to a weight (say) of 100 grains—that is, the weight on *one* side, keeping things as they are; then suppose the action of the light is equivalent to a counterpoise weight of ten grains, it is evident that a further weight of at least ninety grains is required to co-operate with the ten grains, in order to produce any change. Now, if we suppose a certain developer to be equal to ninety-five grains, then this, in conjunction with light equal to ten grains, produces a strong preponderance to the other side, the beam will upset and the plate will develop.

It will be seen that a developer may be used any strength short of a strength equal to the supposed 100 grains, without of itself producing any change, and that if one has the means of increasing or decreasing the power of the developer above and below that power at which it is equal to 100 grains, then it is possible to so exactly adjust the power of such developer that it is all but able of itself to produce decomposition; and if there are two different developers, both strong enough of themselves, if used at their full power, to produce decomposition, but both susceptible of having their energies reduced to any required degree, it is evident, I think, that such developers are practically the one precisely equivalent to the other, for with both you have an excess of power at command, and with both equally you can go equally near the verge of *chemical* decomposition as contradistinct from *photo-chemical* decomposition. You can use ammoniacal pyro. of such energy as to cause chemical decomposition of bromide of silver; that is to say, of such strength as to produce general fog. You can do exactly the same thing with ferrous oxalate, and short of this you can develop an

equally feeble impact of light with either. Ferrous oxalate must be used with a due recognition of its oxygen-loving property, for it is exceedingly useful in the development of positives.

I have here some beautiful specimens of positives developed by ferrous oxalate. This application promises to work yet another revolution in our art, and to do as much for positive printing as it has already done for the production of negatives. By-and-bye, if it be your pleasure, I will produce a print by way of illustration.

Photographic printing no longer depends upon uncertain daylight, and it is no longer a slow process, for, by using gaslight in printing instead of daylight in conjunction with paper prepared with bromide of silver and developed by ferrous oxalate, you have both the regularity and the rapidity of the most rapid mechanical printing process. By this means it is certainly possible to produce from a single negative, in a single day of twenty-four hours, 10,000 prints.

NOTE ON A NEW PREPARATION OF GELATINE EMULSION PLATES.

BY H. BURTON JONES.

THE emulsion must be in a condition fit for use at the time the pyrogallic acid is added.

It must be used as soon as added (that is, the plates coated).

The plates must be dried with all possible speed.

Most Successful Formula.

Gelatine	120 grains
Bromide potassium	60 ,,
Silver nitrate	80 ,,
Pyro	10 ,,
Water	6 ounces
Alcohol	½ ounce

GELATINE PLATES.

A WORD OR TWO TO BEGINNERS ONLY.

BY J. S. C.

I ALWAYS carefully read the "Answers to Correspondents" in the "PHOTOGRAPHIC NEWS," and have come to the conclusion that a good many of the correspondents who write for information are young beginners in the new work of manipulating gelatine dry plates. May I beg those gentlemen who have mastered this process, and who are clever, skilful workers in the same, to pause, should they have honoured me by reading so far, and pass on to other matter, since this communication can be of no interest to them—only to beginners.

If it is your intention to practise the gelatine process, whether for pleasure or profit, start with the determination to succeed, and that of itself will remove a host of difficulties, for of course difficulties will arise, and if you think it is going to be all plain sailing from the first, I can assure you that is quite the wrong impression to have.

You have been told that whatever you may happen to know about the wet process is all so much in your way, and that you must unlearn all that in order to succeed with gelatine. To my mind that's a malicious old bogey conjured up to frighten timid beginners, and my advice to you is, don't think at all about him. Of course, there is a great difference between the behaviour of a wet plate and a dry one in development; but the end is the same, a good printing negative.

In regard to the light by which you work. There is not the slightest need for you to work in the dark, so that you can't see which side the film is, or when you have anything "come out." Have plenty of light, only let it be ruby or red.

Don't go here and there and eveywhere for your plates. Get one sample, and just study the printed instructions sent with them. Follow these to the letter. You may take my word for it, that those who prepare the plates know the best mode of developing them, and if they say add five drops of this or that, don't think that three or ten will do just as well. Perhaps you are so situated that you can easily go to see a clever artist perform: if you are, so much the better—I wish it had been the case with me. There can be no harm in saying I use Messrs. Fallowfield and Thomson's plates—no doubt all the other makers send out good ones as well—and I must say that where I have failed it has been my fault, and not that of the plate. The way I proceed is to soak the plate for a minute or so in cold water; pour off that and add three grains pyro in two ounces of water, and slightly rock the dish; then drop five drops of ammonia and bromide (according to formula) and rock considerably. I am told to do this gently, but I find that plenty of rocking prevents spots and stains, and, for all I know, it may cause the development to be somewhat longer about; still that one does not mind. As soon as I see the high lights appear, I drop in the cup twenty drops of the last named solution, and that always brings up the picture to proper density. Don't give up gelatine plates because you havn't a dropping bottle. I havn't one, and never saw one. If you turn the bottle you wish to drop from upside down, and as you take out the stopper draw it over the edge of the bottle, the liquid will flow to the edge and drop off with most complete regularity.

Of course it is not suggested that you take out the stopper while you have the bottle upside down. Always drop the ammonia-bromide solution into the cup, and then pour the solution that is in the dish into the cup, which ensures a complete mixing. If you go on in this way you will soon see when it is necessary to depart from the letter of the instructions sent, but in beginning don't go dodging about and performing any fancy tricks of your own; that kind of thing will soon wear you out.

I use a good portrait lens, and always keep in the same stop, and shall continue to do so till much brighter weather comes, and by which time I shall have had still more experience. Using the same stop will assist you to get the right exposure in the soonest way.

Kindly understand that I am little more than a beginner myself, and am feeling really frightened at my audacity in presuming to offer advice to anyone; but I am a bit of an enthusiast, and, besides that, have experienced such pleasure in the use of the new process, that I hope I shall be pardoned for my presumption, and that some young beginner may from this take fresh heart and go on to success.

You will find all the new dry plates advertised as instantaneous. I don't say they are not, but it will be far more satisfactory to you to give full exposures; and as you begin to understand the power you hold in your developing solutions you will get good pictures quickly. Don't think at first to successfully develop a plate exposed instantaneously.

If you find the plate during development darken all over and clear when fixed, that indicates certain over-exposure. With gelatine plates, again, you can always try a print as soon as the plate is dry, and you will be pleased to find that what appears to be so thin as to be of no use, will yield a good print. As to intensifying—not having been successful in that direction—I would advise you to do as I strive to do, viz., obtain the proper density in the development. If you must intensify, why there is the formula published by Mr. Edwards, which you can and must exercise your judgment in using; always bear in mind that you are dealing with most poisonous materials.

One word more: when you have a good negative, don't cheat yourself out of your good fortune by hastening the drying of it. It must dry spontaneously, and will, of course, take some time. Have patience at each stage of your proceedings, and then I sincerely hope you will be able to say as I do—"It is the rule for me to get a good negative, and the exception for me to get a bad one."

The Photographic News.

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"AT HOMES."

WE invite our readers' attention to a series of "At Homes," commenced in the present number. This week we record a visit paid to the well-known establishment of Messrs. Elliott and Fry, of Baker Street, while the subject next week will be, "Lieut. Darwin, R.E., at the School of Military Engineering, Chatham."

TOPICS OF THE DAY.

AN article, written by a well-known hand, will appear from week to week, discussing matters of immediate interest. Captain Abney furnishes us with the first, upon "Gelatino-bromide Prepared with Glycerine," which will be found in another column. The subject next week will be, "Portraiture without a Studio," by Mr. H. P. Robinson.

GELATINE.

THERE is one circumstance to which proper attentiou has never beeu given by photographers who work the gelatine process. No doubt the preparation of commercial plates is in the hands of experienced and skilful manufacturers, and no doubt, too, that those who themselves prepare the plates they use, do so with due caution and consideration. But ueither one party nor the other produce their own gelatine, nor would they be able, even if they did, to prevent the defect to which we refer, namely, chance impurities in the gelatine itself. We have recently had under examination a goodly uumber of defective negatives, and we have little hesitation in saying that in many of them the blemishes were due to a lack of uniformity in the reduction of the silver, minute particles in the film in some cases showing unmistakably that there were impurities in the gelatine.

We have no wish to call in questiou the quality of the gelatine usually supplied by makers. We merely desire to point out that there may arise phenomena in a gelatine plate over which the photographer has no control, and he must not be too ready to ascribe to the process of preparation, or mode of development, defects which have nothing to do with these operations. There are plenty of good gelatines in the market—clear and tough; but it does not follow that because a gelatine is eminently suitable for ordinary purposes it will approve itself to delicate photographic operations. Minute spots that only appear as slight turbidity may or may not affect the photographic result; but, as every photographer knows, there are some organic bodies capable of reducing silver far more readily than others.

Gelatine is not like its photographic sisters—albumen and collodion. Of the three, collodion is probably the most trustworthy vehicle for the sensitive salts; we can rely upon a clear sample of collodion. The pyroxyline from which it is prepared must be perfect and free from impurity, otherwise it refuses to dissolve intact, and we only employ collodion which is free from turbidity and sediment. In the case of albumen, too, we have a material of coustant uniformity, and if it contains elements inimical to photographic operations, we know, at any rate, of their presence. But of commercial gelatine we know little, and chemists cannot help us very much. Even supposing it to be free from every possible impurity, its behaviour under the influence of heat and cold, wet and dry weather, is ofttimes most capricious.

But it is more especially of impurities in the gelatine that we are speaking, and when we consider for a moment the mode of manufacture, the wonder is that complaints as to its quality are so rare. For collotype printing, and in the manufacture of carbon tissue, very much depends upon the quality of gelatine used, and when it comes to acting upon a film with chemical solutions of various kinds, the subject becomes grave indeed. As our readers know very well, the sources whence our gelatine is derived are very various. Every description of animal refuse and offal is made to yield up gelatine, which is usually purified in one of two ways: either the gelatine solution, when warm, is permitted to stand, and so become clear, or its turbid character is got rid of by forcing it through strata of charcoal or other filtering medium.

Several makers now prepare what they term photographic gelatine, and this is usually of the finest character, so far as clearness and toughness are concerned. If gelatine is good, a cake of it may be immersed in water for a dozen hours without showing any signs of disintegration, while a bad sample will fall to pieces under the test. The more moisture gelatine will absorb, the better it is as a rule, and photographers may for themselves determine how much water a sample will take up; they have but carefully to weigh the sample dry in the first place, and afterwards note the weight when it has been suffered to lie in an atmosphere saturated with moisture for some hours. The amount of pressure required to break into a gelatine jelly is also a good test, care being taken, of course, that the jellies under comparison are made up of the same proportions of water and gelatine, and that the metal rod that is allowed to press upon the jelly is of the same weight and description in all cases.

In this wise a very good idea may be obtained of the value of a gelatine; but transparency is a property which photographers should not overlook. We have recently beeu examining, by the aid of a microscope, several gelatine negatives forwarded by correspondents, and these, in many cases, show an inequality in the reduction of the silver. In some the silver deposit shows a ragged or saw-like edge, which is often seen when pyro development has beeu pushed too far, and a stroug silver solution has caused coarse particles to be deposited. No doubt some of the phenomena exhibited are due to the attachment of minute particles during development, but there was, to our thiuking, clear proof that impurities in the gelatine were responsible for many of the markings.

We shall take an early opportunity of calling our readers' attention to the subject again, when we have had leisure for a microscopic examination of gelatine plates developed by ourselves, so that special precautions may be taken to prevent the adhesion of dust particles. In the meantime we shall be pleased to hear from any of our readers who may study the subject, for it is one that behoves the worker in gelatine plates to bear in mind when at a loss to discover a cause of failure.

Notes.

The late Mr. George Wharton Simpson was one of the founders of the Solar Club.

Mr. Val Prinsep, the well-known painter, frequently carries a camera with him on his sketching tours.

Captain Abney, R.E., F.R.S., commences a course of six lectures on "Light and Photography" next month at South Kensington.

In his last successful attempt to photograph the stars—or, rather, their spectra—Dr. Huggins employed gelatine plates.

In the Paris police force there are two photographers ranking as inspectors. They have a photographic studio at the *Rue de Jérusalem*, and a small staff of assistants.

The Photographic Exhibition in Pall Mall may possibly be opened rather earlier this year. The prevalence of dull and foggy weather in November materially detracts from its value to photographers and the public.

The albumen preserving establishments on the Danube appear to have failed to satisfy albumenized paper manufacturers, who still prefer to use eggs. The dried albumen, however, is employed a good deal by Continental photographers in their operations.

The attempt made to photograph under water in the Tay was scarcely likely to prove successful. Even with an ample source of light at hand, the difficulties resulting from so much suspended matter in the rapidly running stream must be well nigh insurmountable.

M. Janssen's new photographic observatory at Meudon, near Paris, is rapidly approaching completion. M. Janssen proposes to take photographs of the solar disc not only daily, but almost hourly—when the sun can be seen, *bien entendu*—by the aid of an automatic camera and his well-known *revolver*. We have no such establishment in this country.

The Board of Trade have ordered that photographs be taken of the fallen houses in Seven Sisters' Road, an accident that scarcely escaped being a grave calamity. The Inspector of Explosives at the Home Office is also authorized to have photographed the scene of any explosion that may come under his notice. The object is to obtain a trustworthy record of the affair.

Wheels within wheels. Messrs. Elliott and Fry, who publish a large number of portraits, have employed photography in the production of a trade card. Of some celebrities they have several portraits—of the Prince Imperial, to wit, twenty-eight—and that their customers may better select from the stock, a reproduction of the whole series in miniature is forwarded to facilitate selection.

A photograph has been taken of the *Thunderer* gun in its casemate in the Woolwich marshes, so that if the weapon bursts, a comparison between pictures taken before and after the event will plainly demonstrate the extent of damage done. The gun which burst in the Sea of Marmora under such lamentable circumstances has been pieced together as far as it was possible, and photographed likewise.

The mirror, or looking-glass of the heliograph that is in use just now in the Afghan campaign, only measures ten inches across, but a glass of this size is capable, it seems, of reflecting the sun's rays a distance of fifty miles; in other words, one soldier can read another's signal at this interval, the mirror showing like a bright spot in the far distance. The appearance and disappearance of this spot or ray constitutes the signal.

We heard the other day "the true story" of the rage for beauty portraits. It is this. The year of the Vienna Exhibition the Countess of Dudley was photographed in the Austrian capital; the picture was so successful that thousands of copies were sent to London. Thus the ball was set rolling, and photographers naturally begged permission to publish whenever they secured a good and attractive portrait. This we have on good authority, but we cannot help thinking there must be a better.

By the way, we see Messrs. Downey are publishing a new series of Mrs. Cornwallis West. The portraits will not be the less favourably received because they are very good ones.

Mr. W. H. Davies, in his paper last week on "Rapid Studies," mentioned the old and interesting instance of depicting a revolving wheel at the Polytechnic, while lighted up for a fraction of a second by an electric discharge. When such extraordinarily short spaces of time come to be spoken of, the mind is quite incapable of appreciating their duration, and one might as well talk of a millonth of a second as a billionth. A clever captain of artillery, in a recently published pamphlet, tells us, however, that a millionth of a second bears the same proportion to a second as this does to a fortnight.

From Paris comes the news that the Jablochkoff candle (electric) with which the *Place de la Bastille* and *Avénue de l'Opéra* are illuminated gives much satisfaction, and many private establishments are taking up the electric light. The best feature about the Jablochkoff candle is, that the source of light is not a spark of intense brightness, but incandescent kaolin, which, after the fashion of tallow, gradually fuzes away between two electric wicks. As our readers know, Edison hopes, also, to solve the difficulty of electric lighting by incandescence, his last idea being to put into a state of glow a tiny horseshoe of carbonized paper.

FRENCH CORRESPONDENCE.

Course of Lectures on the Reproduction of Works of Art—Programme of the Course—Steel Legs for the Camera—Photographic Reproduction of Plans and Drawings—Choice of Method and Rules to be Observed.

Course of Lectures on the Reproduction of Works of Art at the National School of Decorative Art in Paris.—Photography is capable of rendering essential service in the region of art manufactures. At the present time there are in Paris few manufactories or workshops of any importance, where some branch of art manufacture is carried on, that does not possess an arrangemant for taking photographs. In some cases this is employed in the reproduction of models or of finished work, intended to serve as working drawings fer the artisan, or to illustrate the trade catalogues; in others it serves the purpose of the numerous applications of photography in copying or transferring the pictorial works which form a new field of knowledge indispensable to the youth of hoth sexes intending to devote themselves to an artistic career. It will, therefore, be easily comprehended that a public course of instruction, having for its object all the means of reproduction, meets a real want, and that the practice of photography will occupy an important position in such a course.

Programme of the Subjects of Instruction.—The preliminary lectures of last year obtained so great success that the authorities decided to introduce officially—as I have already explained to my readers—photography as a subject of instruction in the National School of Decorative Art in Paris. This instruction forms part of the course of industrial reproductions organised at this school. A complete programme has been published, and the course has been attended hy a large number of students since the commencement of the present term. It forms a valuable complement to the study of drawing, painting, and sculpture, and should have the result of supplying our workshops with a body of capable and efficient workmen; or of producing a number of special copyists who, starting in business on their own account, will be able to render good service to the manufacturing arts and sciences. The programme of the course has been most happily arranged, so that from the first lesson the student is placed in a position to appreciate and understand the importance of the subjects with which it is intended he should render himself familiar. Thus the reproduction of line or stippled drawings includes all the processes of engraving known up to the present day, and the reproduction of works in intaglio or relief (rendered in the apparent condition of the original) relates to all the processes of modelling and chasing, either by the old methods or by new ones, such as that of electro-plating. In a word, the whole art of copying will be found to be included in this programme, and photography is pre-eminently fitted to popularise and develop it. The processes of phototypie, of photo-engraving, and of photo-lithography, the different methods of printing in fatty inks, and of photographic transfer in prussiate or *cyanofer*, ought all to form subjects of instruction in a course of this kind. It will be seen, too, that the photographic processes with so-called coloured powders for the reproduction of enamels must occupy an important place in it. For all these applications the photographic plate will form a starting point; the student of the art of reproduction must therefore first be initiated into photography. Hence, a thorough apprenticeship to our art forms the foundation of the instruction in question. The professor of the course also has taken great pains from the very commencement of his lectures, after having passed in review all that has hitherto been accomplished in this vast field of art, to describe the method hy which is obtained this indispensable plate, whether it he a negative or positive, according to the purpose for which it is required; in one word, he has explained to his pupils how to become photographers. The different apparatus and instruments employed have been described and explained in succession, and all the processes adopted have been demonstrated. Undoubtedly, the most interesting part of these lessons was the examination of the apparatus and specimens to which allusion was made, and the experiments by which this examination was illustrated. Nothing was neglected by the professor to interest his pupils in this part of the subject, so attractive to youth, and, with the exception of a few petty omissions, which he will no doubt repair in his subsequent lectures, everything that has been hitherto produced in this immense region of photography was alluded to.

The Application of Steel to the Construction of Camera Legs.—When speaking of travelling apparatus he even described the valuable application of steel in the construction of the legs of travelling cameras, and he requested M. Eugène Cheron to exhibit to the students the portable stand of which he is the inventor. The Photographic News recently contained a description of this instrument, and on the strength of my assertions, an article from the pen of an accomplished critic drew attention to the use of steel for purposes where lightness combined with strength became desirable. This public recognition of the value of this application of the material, for which photography is indebted to M. Eugène Chéron, is a triumphant reply to those who, without having tried the apparatus in question, have thought fit to doubt its excellence; it is also a proof that our journal contains in its columns praise only of such novelties as have been approved after careful examination by men of experience. I am on the present occasion glad to be able to note also that M. Eugène Chéron has succeeded, hy the addition of a slight mechanical contrivance, in adapting his steel camera-stand to the purposes of a portable easel for out-door painting.

New Process for Copying Plans and Drawings by Photography.—The students of the School of Decorative Art have also had the pleasure of hearing about a new transfer paper. This paper was brought before the last meeting of the Photographic Society of France by M. Reigel, and is the result of a process the invention of M. Collas. It is prepared by treatment with iron perchloride. After being acted on by light it is only necessary to dip it into a solution of a salt of gallic acid, when a copy of the negative is obtained in black lines on a white ground. Up to the present we have only the so-called *papier-artigue* which is capable of producing this effect; the ferro-cyanide paper of M. Pellet gives a blue line, though by the latest improvements this blue colour has been rendered so deep as to approach very closely to black. When submitting this invention of M. Collas to the above-named meeting, M. Reigel announced that he was engaged in perfecting a special printing frame for working with this paper; it will be mounted on a cast iron support, capable of being tilted, so as to expose the paper to the light without a change of position. By means of a reverse movement the frame will be made to turn round on its support, and the apparatus will then serve the purpose of a drawing table.

Choice of Method and Rules to be Observed in Copying Works of Art.—One of the objects of the course so opportunely inaugurated at the National School of Decorative Art will be to point out the particular method of reproduction best adapted for any special purpose, more especially according as the prints are required to be inserted in the text of a work, or are to serve as plates without any text. The professor will also lay down the rules to be observed in executing copies of works of art with reference to their industrial reproduction hy the different processes he has described. These are points of the highest importance, and will have the effect of increasing the interest of this valuable and practical course of lectures, delivered by M. Vidal with all the talent and ability which are known to belong to him. At each lecture the audience testifies its appreciation of the zeal and skill of the professor by loud and long-continued applause.

K. Versnaeyen.

Topics of the Day.

ON GELATINO-BROMIDE PREPARED WITH GLYCERINE.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

We are all of us, I suppose, too apt to judge matters from our own point of view, and can rarely understand that others may not have looked at things from the same aspect as ourselves. In a paper which I contributed to the Photographic Society of Great Britain on a method of preparing gelatino-bromide emulsions with glycerine, I suppose that I have taken for granted that other folks beside myself had tried the different processes lately described. Some correspondents to the News have undeceived me, and, as requested, I will endeavour to fill up any blanks in the description which I may have left.

Let us suppose we are going to make up about 7 ounces of gelatine emulsion. Weigh out ammonium bromide, 100 grains (or its *equivalent* in zinc, potassium, or any other bromide), and dissolve in 20 ounces of water (not necessarily distilled water). Next weigh out 180 grains of silver nitrate, and dissolve in 6 ounces of water, and add 6 drachms of glycerine to it, and stir thoroughly with a glass rod. I prefer to put this mixture in a glass jar holding about 40 ounces (an empty French prune bottle would answer every purpose).

The bromide solution should now be added very cautiously. Take a 10-ounce measure, and fill it up to six ounces, or thereabouts, so that it is not too full, and gradually drop little by little the solution into the silver solution, stirring very thoroughly the whole time. A milky emulsion forms, and gets thicker and thicker till the whole bromide in the 20 ounces is added, though, of course, the fluid is *per se* thinner; a quarter of an ounce of nitric acid is next added, and well stirred up. This addition is made to save any chance of fog, which might be caused by the excess of silver present, the reason of which I have already given in the News, and need not repeat in a practical description of a process.

This emulsification is better carried on in a dark room, though it is not absolutely necessary. Here let me remark that the bromide solution must be poured into the silver solution, and not *vice versa*, or a failure will be most probable. The glass jar and its contents may now be placed away into a cupboard, and left for as long a time as is convenient, but not for less than a quarter of an hour. By the latter time the silver bromide will have fallen to the bottom of the jar, with the exception of a very *slight* milkiness, which will subside in a couple of hours. The silver bromide, however, left in suspension at the end of the quarter of an hour is so small that it may be decanted off without detriment to the emulsion, and with infinitesimal lightening of the pocket. The jar may be tilted, and the liquid poured off, or a syphon may be introduced (and this is a neater way), and the liquid syphoned off close to the precipitate. About 20 ounces of water is again poured into the jar, the precipitate *well* stirred up, and again allowed to subside. As soon as ever the subsidence takes place, the water is again decanted or syphoned off. This operation is repeated four or five times, after which the decanted water may be tested for acidity, and for silver nitrate.

To try for the former, I hold moistened litmus paper over an open ammonia bottle till it is thoroughly blue, wash it well in distilled water, and then throw the washed paper into the decanted water. The faintest trace of acid will redden it. If it *does* turn red the washing must be repeated. Let us pause for a moment, and see, after five washings, what amount of acid would be present, even supposing we left an ounce of water behind after each decantation. Six drachms of acid were originally added to about 27 ounces of water. In each ounce, therefore, there would be $\frac{6}{27}$ or $\frac{2}{9}$ of a drachm of acid left. The fluid is, after decanting 26 ounces, made up to 20 ounces, and each ounce will contain one-twentieth of $\frac{2}{9}$ drachms of acid, or $\frac{1}{90}$ of a drachm; continuing the calculation in the same way after the third washing, there will be $\frac{1}{1800}$ of a drachm; after the fourth, $\frac{1}{36000}$ of a drachm; and after the fifth, $\frac{1}{720000}$ of a drachm, an amount almost inappreciable. To test for free silver nitrate, add to the wash water 1 drop of potassium chromate. A red colouration indicates the presence of silver nitrate. In case of the presence of either one or the other, as is shown by the litmus paper and the chromate, the washing must be continued till they are completely eliminated.

The next part of the process has now to be taken in hand. 100 grains of gelatine are soaked in 2 ounces of water (the gelatine most suitable is Nelson's "No. 1 photographic gelatine"), and another 100 grains in 3 ounces of water. The vessels containing both these (after the gelatine is properly swelled) are placed in warm water of about 100° Fahr., which will gradually dissolve up the glutinous masses. This effected, the smaller lot is placed in a wide-mouthed bottle capable of holding about twenty ounces of fluid, and the washed silver bromide added to it. The mouth of the bottle is then closed by a cork or bung, and the contents well shaken up till it becomes a froth. It is next placed in a kettle or saucepan containing warm water of about 100°, and the latter is held over a Bunsen-burner or spirit lamp to keep up the temperature. When the froth has subsided the bottle is again shaken, and the warming process repeated. After two or three such shakings a little of the gelatine emulsion may be dropped upon a glass plate, and examined for granularity. If absent, so much the better; but if present, half the second lot of dissolved gelatine must be added, and the shaking repeated.

We now come to a part of the process about which opinions differ. My own idea is that the emulsion may be raised to boiling point without damage; others contend that this gives rise to frilling—I think not, myself. It may be raised two or three times to boiling point, and I have not found the plates prepared with the emulsion have any more tendency to frill than others prepared with an emulsion which has been worked at a low temperature for days. If the emulsion be raised to boiling for five minutes, then shaken, and the same operation repeated a second time, I believe that you have an emulsion which is as rapid as any to be obtained by the more fatiguing method. At any rate, this plan will give as smooth an emulsion as any other method, provided the operator's fingers are not all thumbs when the bromide is dropped into the silver.

When the emulsion is ready, the remainder of the gelatine solution not already added should be poured into the bottle, together with half an ounce of alcohol, and after a final shake and filtering through washed cotton wool, it is ready for coating the plates.

Perhaps, while I am writing, I had better give an outline of a reliable method of preparing the emulsion with washing, using the same proportion of gelatine and bromide of silver. In this case, it is necessary, however, to use an excess of soluble bromide.

The mode of preparation is well known, but it may be handy for reference:—Take 100 grains of ammonium bromide (or its equivalent in other bromides) and place it in a glass jar with 100 grains of gelatine (No. 1 photographic gelatine), and add 2 ounces of water. When the gelatine has swollen, and the bromide is dissolved, warm in saucepan before described up to about 100° Fahr. Next dissolve 170 grains of silver nitrate in 2 ounces of water, keeping the temperature of the latter down to about 100° (this may be done by putting the silver in a large test-tube and warming it in the saucepan). Pour the silver solution drop by drop into the gelatine solution containing the dissolved bromide, rinse out the test-tube, and shake the emulsion vigorously till it is nearly all froth.

The gelatine emulsion as thus prepared may be warmed

at once to nearly boiling for five minutes, or may be "cooked" *a la* Bennett, according to the fancy of the operator. At any rate, whichever plan is adopted, the emulsion must be washed. In a properly-lighted room, the four ounces of liquid emulsion are run into a dish (a soup plate or a saucer answers every purpose) and allowed to set.

For washing, I prefer Wratten and Wainwright's plan of squeezing the gelatine through canvas used for worsted work. The set gelatine is transferred by aid of a piece of glass on to a 12-inch square of this canvas. The sides of it are gathered up, and the gelatine squeezed through in long vermicelli-like strings into a jar containing filtered water, where it may remain five or ten minutes. The water is strained off, and the gelatine once more transferred to the canvas and again squeezed through. When this operation is repeated three or four times, the soluble salts will have been sufficiently (if not totally) eliminated.

The gelatine is collected, and melted; 100 grains of fresh gelatine are dissolved in 2 ounces of water as before, and with half an ounce of alcohol added to it previously to coating the plates.

One thing, be it remembered, is, that the oftener an emulsion is rewarmed after setting, the less setting properties it has. It is therefore to be recommended that not more emulsion be made up than is requisite to coat the number of plates which may be wanted to prepare. It is the opinion of some experts that the washing and cooking of the gelatine is absolutely essential for rapidity. Personally, I do not hold that idea, but for those who do, I certainly should advise them to try the above formula, to prolong the emulsification for a day or two, and to wash the set gelatine as described.

ON THE PHOTOGRAPHIC SPECTRA OF STARS.

BY W. HUGGINS, D.C.L., LL.D., F.R.S.*

The author presented, in December 1876, a preliminary note on the subject of this paper, together with a diagram of the spectrum of Vega compared with that of the sun.

The author refers to a paper by Dr. William Allen Miller and himself in 1864, in which they describe an early attempt to photograph the spectra of stars.

Other investigations prevented the author from resuming this line of research until 1875, when a more perfect driving clock, by Grubb, enabled him to take up this work with greater prospect of success.

The author describes the special apparatus and the methods of working which have been employed.

In consequence of the very limited amount of light received from the stars, it was of great importance not to spread out the spectrum to a greater extent than was necessary for a sufficient separation of the principal lines of the spectrum. The spectrum apparatus finally adopted consists of one prism of Iceland spar and lenses of quartz. The length of the spectrum taken with this apparatus is about half an inch, from G to O in the ultra-violet. The definition is so good that in photographs of the solar spectrum at least seven lines can be counted between H and K.

Though there is considerable loss of light in the employment of a slit, still, for the great advantage which it affords in obtaining spectra of comparison, a narrow slit one-three-hundred-and-fiftieth of an inch in width was always employed.

This slit is provided with two shutters. By means of these through one half of the slit a solar or other spectrum may be taken on the same plate for comparison, and for the determination of the lines in position in the spectrum. This apparatus was adapted to a Cassegrain reflector with a metallic speculum of eighteen inches aperture. The small mirror was removed and the slit of the spectrum apparatus placed at the principal focus of the mirror. A simple but perfectly successful method was adopted by which the image of a star could be brought exactly upon the slit, and retained there during the whole time of exposure, sometimes for more than one hour, by a system of continuous supervision, and instant control by hand when necessary.

Various photographic methods were tried, but the great sensitiveness which may be given to gelatine plates, together with the special advantages under long exposures of dry plates, led finally to the exclusive adoption of this method.

The photographs were examined and the lines measured by means of a micrometer attached to a microscope of low power. These measures were reduced to wave-lengths by the help of solar and terrestrial spectra, use being made of M. Cornu's map of the ultra-violet part of the spectrum, and of M. Mascart's determination of the wave-lengths of the lines of cadmium.

Photographs have been obtained of the stars Sirius, Vega, α Cygni, α Virginis, η Ursæ Majoris, α Aquilæ, Arcturus, β Pegasi, Betelgeux, Capella, α Herculis, Rigel, and Pegasi; also of the planets Jupiter, Venus, and Mars, and of different small areas of the moon.

The spectra of Sirius, Vega, α Cygni, α Virginis, η Ursæ Majoris, α Aquilæ, and Arcturus are laid down in the map on the scale of M. Cornu's map of the ultra-violet part of the solar spectrum.

The stellar spectra extend from about G to O in the ultra-violet.

The spectra of the planets were taken on the plan suggested by the author in 1864, in which the planet's spectrum is observed or photographed together with a daylight spectrum. These photographs show no sensible planetary modification of the violet and ultra-violet parts of the spectrum of the planets Venus, Mars, and Jupiter.

Numerous spectra of small areas of the lunar surface have been taken under different conditions of illumination, and during eclipses of that body. The results are wholly negative as to any absorptive action of a lunar atmosphere.

The author is preparing to attempt to obtain by photography any lines which may exist in the violet and ultra-violet spectra of the gaseous nebulæ. He also points out the suitability of the photographic method of stellar spectroscopy, first inaugurated by his researches, to some other investigations, such as—differences which may present themselves in the photographic region in the case of the variable stars, the difference of relative motion of two stars in the line of sight, the sun's rotation from photographic spectra of opposite limbs, and the spectra of the different parts of a sun-spot.

In the hope of throwing light on many physical questions suggested by the stellar photographs, the author has taken for comparison a number of terrestrial spectra, especially of hydrogen and calcium, under different physical conditions. As he is still pursuing this inquiry, he reserves an account of this part of his work.

* Condensed from abstract of paper by W. Huggins, D.C.L., LL.D., F.R.S., read before the Royal Society, December 18, 1879.

Correspondence.

A MITE IN FAVOUR OF RAPID DRY PLATES.

DEAR SIR,—By accident the other evening I placed a plate in the dark-slide with the film side reversed (next the springs). I was taking a cabinet bust portrait with the Luxograph apparatus, having previously stopped the lens down. Fortunately, my plate, to my surprise, proved quite a success. Since then I had to take a lady and gentleman to face each other. Instead of taking one at each end of the studio (an arrangement not always convenient) I thought of my reversed plate, and turned the experience to account, by reversing the plate for lady's portrait, taking care to adjust the focus so as to allow for the film being a trifle further back in the camera, which proved successful.

One need not fear the springs touching the film damaging the plate. With the rapid plates the lens can be stopped down, and the focus will be sure without alteration.—Yours very truly, Geo. Tuohy.

GREEN GLASS FOR DARK ROOM—DRY PLATES.

Sir,—Permit me to make a suggestion to the makers of non-actinic glass, that a deep shade of green would be a godsend to those who are obliged to work all day in a horribly dark room, with its unnatural hue of red or yellow light. If I may judge of its effects upon my own sight, premature blindness will not be long unknown as the photographer's plague.

It is impossible to over-estimate the value of dry plates for exceptional use, but they are not an unmixed good. I have used several gross of them this winter, but shall be glad when the light is so improved that I may return to my old love again. I think the price charged by the makers altogether out of proportion to the cost, and hope we shall soon have the benefit of increasing competition.—Yours faithfully, W. Hall.

80, *West Street, Brighton, January* 20.

EFFECT OF CHLORINE ON PLATINUM IMAGE.

Dear Sir,—In a well-written paper, read before the Manchester Photographic Society, Mr. James Young states that the platinum image can be attacked only by chlorine and *aqua regia*.

This statement may be said to be correct, or the reverse, according to the meaning intended to be conveyed. The platinum image is not attacked by chlorine, unless the latter be in nascent condition. Thus a jar of chlorine has no effect upon a platinum print; but by the reaction of hydrochloric acid upon nitric acid, nascent chlorine is evolved, together with chloro-nitric and chloro-nitrous acids, which may have some influence in aiding nascent chlorine.

Gold is attacked by chlorine, forming the ter-chloride; but platinum only absorbs it. We have a print fastened to the wall of a room which is often filled with the fumes of chlorine; yet this print shows no sign of alteration.

As chlorine is often used as a purifier in sick-rooms, and for other purposes, we are glad to be able to dispel any fear that may be entertained for the permanence of prints under its influence.—We are, sir, yours faithfully,

The Platinotype Company.

PORTRAITURE IN SITTING ROOMS.

Dear Sir,—In last week's News Mr. T. Parkinson, in giving a description of the "Wonderful Group Photograph" taken in the Albert Hall, Bolton, speaking of instantaneous dry plates, says: "I have been able to take good portraits in my sitting room in less than two seconds." Would it be giving Mr. Parkinson too much trouble to ask if he would kindly give a poor amateur, who has no other place than a sitting room to work in, some directions how to proceed?

Perhaps a short article in the News showing how a sitter is to be placed, &c., would be welcome to more than your puzzled correspondent, Yalnif.

Proceedings of Societies.

West Riding of Yorkshire Photographic Society.

The adjourned meeting of this Society was held on Monday, the 5th instant, at the usual place. The minutes having been read and confirmed,

The Secretary read the result of the ballot for officers for the ensuing session as follows:—

President—Mr. W. T. Burrow.

Council—Messrs. E. Greaves, E. T. Jenkins, E. Passingham, J. S. Shaw, R. Broadhead, J. Gunstone, and J. Smith.

Treasurer—Mr. J. Howarth.

Auditor—Mr. W. G. Thomson.

Honorary Secretaries—Messrs. J. Crosthwaite and R. Holgate.

The usual votes of thanks were passed to the retiring officers, and suitably acknowledged; after which the Secretaries presented the Annual Report, which, with a paper by Mr. J. Garratt, of Dewsbury, on "Clean Negatives," will appear in our next.

Photographic Section of the Imperial Polytechnic Society, St. Petersburgh.

At the meeting of the above Section on the 7th of December, Gen. Birkin presiding, a committee was formed to provide means for holding a Photographic Exhibition in the autumn of 1880. A limited number of foreigners will be invited to exhibit at the same as soon as the necessary arrangements are made.

Mr. Freybus (who published a photographic journal some twelve years ago in St. Petersburgh) was introduced to the Society, and gave his opinion as to the cost of maintaining a journal devoted to the interests of photography, and asked for permission to allow him to canvas for subscribers with a view of issuing a photographic paper if he could obtain sufficient support on the part of the fraternity.

Mr. Lapteff hereupon presented the Society with this year's *Obsor Graphitscheski Iskoustvo*, and remarked that the editor of the said journal, Herr Schneider, would only be too happy to be permitted to print the minutes of the Section; therefore he (Mr. Lapteff) regarded it as folly to start a new paper if Mr. Freybus, with his experience, would co-operate with Herr Schneider to supply news for the journal purely photographic. This idea was warmly received, and it was further proposed that in the event of coming to terms, the words "and organ of the Photographic Section," be inserted under the present title.

A vote of thanks having been voted to Mr. Freybus for his kindness in coming forward,

M. Levitsky handed round for inspection several prints taken with aid of the electric light, which he has fitted up in his studio on Mr. Vanderweyde's system. Notwithstanding that the subjects were very various, they left little to be desired. It was noticed that silver ornaments—such as epaulettes, stars, medals, &c.—gained in detail when taken with the light.

M. Levitsky observed that he was in a position to take portraits in twelve seconds at any time, and was so sure of good results that he would rather not work any more by daylight. He further stated, in answer to the president, that in experimenting he found that carbon containing an admixture of quicksilver gave the most actinic although dim light; but he was afraid of using them generally, on account of the vapour emitted by them being injurious.

M. Shierl showed some new lenses (Ross's) to the members, and offered them to any of those who would like to try them and give their opinion on them at the next meeting.

Talk in the Studio.

South London Photographic Society.—The next meeting of this Society will take place on Thursday, February 5th, at 8 p.m., in the Rooms of the Society of Arts, Adelphi.

A Photographic Action.—At the Bloomsbury County Court on Friday last, the case of Loveigno *v.* Wells was heard, in which the plaintiff, a photographer, of Kentish Town Road, sued the defendant, a house-agent of Leicester Square, to recover the sum of five pounds, being the sum agreed for a series of photographic views of residences which the defendant had to let or sell, and which were intended for exhibition to his customers. Mr. Willis, who appeared for the plaintiff, said the delivery of the goods was not denied by the defendant, but he rested his defence on the ground that the work was imperfectly executed. The plaintiff having been called, proved the execution and delivery of the order as well as the reasonableness of the charges; his case ended, the defendant, being called, said he had all along objected to pay the plaintiff for the photographs, as after a short exposure in his office they had entirely faded, in consequence of which he had them removed. In cross-examination the defendant admitted that he received the photographs in April last, and that they had been exposed to a strong light for several months in his office. It was proved by a skilled witness that the fading was occasioned by the proofs being insufficiently washed. The learned Judge, however, considered that as all photographs were calculated to fade

more or less after considerable time of exposure, and as this defence had been unsuccessfully set up before, he had no alternative but to rule in favour of the plaintiff for the amount claimed, with costs.

The Identity of the Claimant.—A new adaptation of the appliance known as the "Identiscope" has been just completed by Mr. Mathews, of this city, for Mr. Guildford Onslow. Externally it resembles a stoutly-made portfolio, partially open and set on end. On each side in the interior are mounted "Tichborne photographs" the size of life. Of these photographs the especial peculiarity is that instead of being each an entire portrait, representing respectively the "original Tichborne" and the Tichborne Claimant, both have been divided perpendicularly at an exactly central line, and the divided portions have been then transferred and duly adjusted, the one to the other. The resulting effect is somewhat singular, inasmuch as the younger head wears a hat of which the elder is devoid. In respect of the other details, however, the indubitable match of the features when thus affixed is such as to be regarded by believers in the Claimant as an all-sufficient proof of his identity with the "original Roger." In the bisection of the portraits Mr. Mathews relies upon certain geometrical data, by which, he contends, each half of the portrait is shown to be the incontestable equivalent of the part removed. The portraits are supplied directly from "negatives" in the possession of Messrs. Maull and Fox, well-known photographers, of Piccadilly, London, to whom the Claimant gave several sittings a short time prior to his incarceration.—*Bristol Evening News.*

The Tay Bridge Disaster.—The Messrs. Valentine, of Dundee, were at the bridge a week ago, endeavouring to take photographs under water. They found the actinic rays of the light under water at least three hundred times weaker than those on land in a dull winter day. Before further experiments could be made, a pneumatic apparatus would have to be provided. It is probable, therefore, that under-water photographs will not be taken, and that the Court of Inquiry will have to depend for information regarding the condition of the sunken girders on the photographs already made at low water, the reports of the diver Simpson, who has made a careful inspection of them, and the girders themselves, if ever they are floated to the shore.

Photographs in Colours.—At any time these last twenty years it has been said, "Ah, if it were only possible to photograph in colours!" The mystery has been solved—the secret has been discovered—so at least it is said. A humble little scientific workman living in a Parisian cellar has called out, "Eureka!" and coloured photographs, brightened by nature, and without artificial means, are to be the fancy next season. There is a vast difference between a photo-print coloured by hand and an impression that retains the colour that we see reflected on the glass of a camera. Already Paris has developed the idea, the right of this admirable secret has been secured for England and the Channel Islands, and when the sun comes again to cheer us the young ladies with beautiful complexions, and the matrons with gorgeous dresses, can be reproduced in a picture, not in dull brown and monochrome, but in the colours that are so charming to the eye. The new invention of photochrome will cause a revolution in the art of portrait taking, and by its means the most charming landscapes, forest scenes, and flower-gardens can be preserved for the memory. So may it be! But "hope tells many a flattering tale."—*Illustrated London News.*

To Correspondents.

Leo Norhumbeland, Bach, Nemo, Gelatine.—See Captain Abney's article in another column.

V. Z. Y.—If your negatives are transparent in the shadows (you say your objects are black and white) there should be no difficulty about getting black prints with silver. Don't tone too far, and if your negatives are not dense enough, try bichloride or lead intensifier. We should think, if you want a cheaper process, Poitevin's new one would do. Tell us the nature of your lenses, and we dare say we could give you information you want. It would be hardly worth while to send instruments all the way from Scotland.

C. N.—One of the best plans of taking silver stains from the hands is to rub them with a solution of iodine in iodide of potassium, and then to wash with hypo solution. The iodine solution is easily made: dissolve a little iodide in water, and then add a few crystals of iodine.

A Constant Subscriber.—The broken argentometer should not hurt the bath. If any mercury got into the solution, this might be poured off at once, and should not be injured. We should think something else is causing the mischief, and advise proceeding in one of the ordinary ways to rectify the bath. Let us know again if you do not succeed. Mercury will precipitate silver if you allow time.

P. M. L.—We have submitted your note to a Government inspector of gas, and he says that the Act requires for London gas that its illuminating power shall not be less than sixteen sperm candles, with from ten to twenty grains of sulphur per 100 cubic feet and not more than from five to ten grains of ammonia. Now, in order to be always up to the standard, it is necessary that the companies should always supply it better than specified, and hence it is that in London the gas is rather above that mentioned. Your Newcastle gas is evidently not so bright as London gas just now, although it is better in respect to impurities. For all the testing and supervision, we hardly think the gas generally supplied now is as good as it used to be; it is a subject that photographers will be much interested in in the future, we are sure.

George.—The grain on your copy is due to the texture of the paper, which has been enlarged together with the picture. You cannot expect a copy of a paper photograph to be equal to the original, especially if enlarged. The Autotype Company do this sort of work, and make a speciality of it, as also does the Woodbury Company.

C. Bacon.—No. 1 is best, but it is not sufficiently toned.

Hardress.—Many ladies are photographers. There is no need to soil one's hands if proper care is taken. We will gladly give advice.

Med.—There would be no import duty, but there would, as you might suppose, be considerable risk of breakage in bringing the dry plates over. Moreover, as it would be impossible for the Customs to open the packet, we fear they would make a difficulty unless it was a small one. We will enquire for the name of a good firm and prices, if you wish.

Fie.—We have had no experience of the retouching pencils you speak of. If composed of silver and mercury—an amalgam, in fact—there would not be much difficulty in making them on a large scale, but we doubt if it would pay you to do so. Mr. Werge would probably get them for you; write to him; his address is in our advertising columns. A genuine lead pencil is usually preferred by photographers.

J. T. W.—The pictures are all of a promising character; they are a trifle dark in the shadows, but if you are working for deep shadows after the Adam-Salomon school, it will not do to lighten up too much. At the same time your high lights, especially in No. 3, are too chalky, although this is one of the best pictures you send. The gelatine plate is very good as a start off; the defects are purely mechanical. We mean that some foreign matter has attached to the film, before, or after, it came into your possession. Gelatine plates are not so easy to work, whatever people say to the contrary, and you must not be discouraged. As to burnishers, No. 1 we have heard highly spoken of, but we have no practical knowledge of it.

J. A. Sykes.—Thank you. If we have space, will use it; but our columns are very full just now.

A. M. R.—It was practically the same formula in both cases.

M. Ferranti.—Four fine cabinets have been received. They are all of them very perfect, as we need hardly say.

G.—The plain normal collodion of the photographer, which is simply bi-nitro-cellulose, dissolved in ether and alcohol, is precisely the same thing as that used by surgeons. It is only when the sensitizing salts are added by the photographer or manufacturer that the difference sets in. Different gun-cottons or bi-nitro-cellulose, after solution, give different kinds of deposits. If you have last year's Year-Book, read a short article by Monckhoven on the subject.

Nemo.—You cannot do better than try iridium (double salt) and gold for toning. The latter alone gives a dirty look to collodion transfers.

Spots.—We have carefully examined your negative—under a microscope, indeed. The spots puzzle us; but we think they must be due to some accidental cause after the negative was finished. Has it been in a damp place? We think dust particles are the causes. Dry-plate pictures have a tendency to become slaty; but gelatine films have been freer from this defect than those of any other process. The negative is not at all amiss, barring the spots.

J. C. Stephens.—You have, doubtless, heard of Mr. Simpson's death. The pictures may be to hand, but we have not seen them yet. We are still making enquiries, and will write again. Three packets should not have gone astray, even from New Zealand.

Photo.—See Photographic News for January 3rd and March 2nd of last year.

Fred. Warner.—Please say if they are dry plate negatives. If so, the reason lies in them. The pictures are good in many respects.

Several correspondents in our next.

The Photographic News, February 6, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photographs on the Retina—Photographers' Cramp—A New Use for Chloride of Silver.

Photographs on the Retina.—There is such a thing as what Albert Smith used to call "periodical news." Every year certain items of intelligence repeat themselves, live their brief hour, and die out only to be revived again at a fitting opportunity. Photographs on the retina may almost be said to have attained this proud position. In the case of a mysterious murder, there is always some one ready to suggest that the eye of the dead person should be photographed, so that tho image of the murderer may be brought to light; but it has been left for the Manchester police to put the suggestion into practice—at least, if we may believe what we read in the newspapers. Mr. Mudd's name has been mentioned in connection with the operation. If he has really been engaged, would he kindly favour the photographic world with the results of his experience? To our mind the whole thing has very much the flavour of a *canard*, as the notion is much more likely to have emanated from the imaginative brain of a "penny-a-liner" than from the cranium of a police-constable. The "force," as a whole, are not much given to science, though on a host of occasions have they found photography come to their aid in the detection of crime. All that is known of the possibility of retaining the representation of visual objects on the retina was well stated by Mr. Bird in an admirable paper read a few months ago before the Photographic Society. Mr. Bird's remarks were based upon an article in the *Revue des Deux Mondes*, and the result of the researches of Boll and Kühne, who investigated the subject, can be summed up very briefly. Boll determined that the true colour of the retina was purple. When kept in darkness, this colour could be retained for about twenty-four hours, but if exposed to light it rapidly disappeared, and he came to the conclusion that tho optical image thrown on the retina was momentarily fixed by the actual formation of a pigmented picture in which purple corresponded to the shadows, white to the high lights and insensible gradations between these extremes to the half-tones. Kühne made some very curious experiments on the eyes of rabbits, conducting his experiments with the aid of a sodium flame, which he found to have but small effect on the retina. Eyes freshly cut from a dead rabbit were placed for a few seconds before an object brightly illuminated, with the result that the retina, when examined by the light of sodium, was found to have on it a vague outline of the image. Believing that death had produced a certain amount of insensitiveness, Kühne reversed the process: he placed a live rabbit before a square opening cut in a wooden shutter, covered its head first with a black cloth to ensure a full development of the purple, allowed the light to act for a couple of seconds, and had the head immediately cut off. "One eye, rapidly extirpated, was plunged in a solution of alum, and the other eye, left in its orbit, similarly treated. Next morning the two retina were detached, and there was distinctly visible in each the square image representing the luminous opening, and more accentuated in the second eye than in the first. Upon exposure to light, the image disappeared by the discolouration of the whole retina." Further experiments enabled Kühne to obtain under similar conditions distinct impressions of a window in which the bars were fairly defined; but here progress appeared to have been stopped, although the enthusiastic investigator was not without hopes that some day he would be able to photograph a perfect landscape. If such conditions as these are imperative to secure even a primitive result, the day would appear to be very far distant when science will come, so far as photographs on the retina are concerned, to the assistance of the detective. Moreover, even if such were the case, it does not at all follow that an image of the murderer's face would be the object depicted. The unhappy girl at Manchester was beaten about at the back of the head, and so far from her eyes resting on her assailant, they may have been fixed on the ceiling, the wall, or some article of furniture, just prior to her death. It would be rather disappointing if Mr. Mudd in his experiments succeeded only in producing a picture (say) of a kitchen table. But, seriously speaking, until he really says so himself, we do not believe Mr. Mudd has attempted to photograph the retina at all.

Photographers' Cramp.—All professions have their peculiar diseases, and photography is not exempt. According to the Paris *Figaro*, French photographers are liablo to what is designated "photographer's cramp." This "cramp" is produced by the rubbing necessary to remove air-bubbles in the manipulation of collodion transfers for enamelling purposes. Our Parisian brethren appear to use the thumb chiefly for the rubbing down process, and, after a time, the member becomes numbed, and almost incapable of use. The remedy for this would appear to be obvious—use a paper folder or some such instrument. One new complaint suggests another, and that is tho probability of an injury to the eyes consequent upon the extremely feeble light which the development of gelatine plates demands. The straining of the muscles of the organ, and the constant effort to see in the dark, cannot but have a bad effect, and when this is coupled with the violent contrast which the bright light of the studio—not that there is much danger of too much light in this dreary winter—affords, photographers' eyes ought to be made of different materials from other people's to stand the continual contraction and expansion of the pupil. Some form of illumination of the dark room—or, to speak properly, of the gelatine negative—is yet needed before work can be conducted with safety and comfort. Mr. Hall, in these pages last week, suggested dark green glass. Has anybody had experience?

A New Use for Chloride of Silver.—Who would have supposed that in the simple reaction which takes place when the photographer throws a handful of common salt into the silver washings from his prints was contained the germ of a method by which the depths of the sea could be accurately fathomed? Such, however, is the case if the theory of a Portuguese chemist be borne out in practice. The difficulty of deep sea soundings is that when the cannon ball, usually used as a weight, touches the bed of the ocean, the line still continues to "pay out," its own weight, combined with the force of the under currents, being sufficient to exercise a considerable strain. The consequence was that before the philosophy of deep sea soundings was as well understood as it is now, astounding depths were recorded, which have since been proved to be utterly fallacious. Indeed, it was a common thing, as Maury, in his fascinating book "Physical Geography of the Sea," has shown, for sounders, too weary of paying out fathom after fathom of line, and having used up five or six miles of hemp, to content themselves with writing "no bottom," when, if they had only known it, they had really measured the depth twice over. Chloride of silver has changed all this, and the mysterious depths of the ocean can now be ascertained with a precision previously impossible. The new apparatus recently described to the Lisbon Academy of Sciences by Senhor Henrique de Lima e Cunha is based on the effects of fluid pressure. It consists of a cone of sheet copper, having as its base a copper diaphragm perforated with six small holes. A vertical wire of pure silver occupies the axis of the cone, and to prepare the apparatus for use this wire is moistened with nitric acid, producing a thin film of nitrate of silver. The diaphragm (which is movable, to allow the wire to be prepared) having been screwed on the cone, is suspended by a ring at its apex, and sunk by means of two weights attached to chains depending from three

rings fastened to the perimeter of the cone. To insure a vertical position, a small float is attached just above the ring at the apex. As the apparatus sinks the water penetrates through the holes of the diaphragm, and gradually rises in proportion as the pressure increases during the descent. The salt water acts on the thin coating of nitrate of silver on the wire, and turns it perfectly white by the production of chloride of silver as far as immersion has taken place. The height the water rises in the cone, and the pressure upon the air within, can thus be accurately registered; and to deduce the depth from these data is a matter of simple calculation. The method is a neat and elegant one, and will be rendered still more perfect if, as the inventor suggests, the instrument on striking the bottom could be detached, and ascend to the surface of itself, thus dispensing with the use of a line.

At Home.

LIEUTENANT DARWIN, R.E., AT THE SCHOOL OF MILITARY ENGINEERING.

Strood Station. We must cross Rochester Bridge to get to Brompton Barracks, the head-quarters of the Royal Engineers, and pass through the close and busy streets of Rochester and Chatham. There is Rochester Castle before us, a grey old pile that stands on a pedestal of green beside the lazy Medway, and near it is the picturesque Cathedral. Across the bridge, and we pass on our right "The Bull," noted in the Pickwickian Papers as the hostelry where the famous ball was held at which Mr. Tupman and Mr. Jingle assisted, and where the episode happened that led Mr. Winkle to the verge of a duel. The four towns, Strood, Rochester, Chatham, and Brompton, are so close together it is difficult to tell where one begins and the other leaves off. "The principal productions of these towns," according to Mr. Pickwick's diary, "appear to be soldiers, sailors, Jews, chalk, shrimps, officers, and dockyard men. The commodities chiefly exposed for sale in the public streets are marine wares, hard-bake, apples, flat-fish, and oysters. The streets present a lively and animated appearance, occasioned chiefly by the conviviality of the military."

Rochester and Chatham have not changed much since the days of Mr. Pickwick, evidently, and before we reach Brompton Barracks we have plenty of time to institute a comparison. We pass up a narrow street and enter the barrack square. The Engineer, as everybody knows, is an aristocrat among the British soldiery; he receives higher pay, and wears a coat of a brighter red than his brethren in the Line; but then he must be acquainted with some trade when he 'lists, otherwise he is ineligible to join the corps of Royal Engineers. At the entrance of Brompton Barracks is a list of the kind of men who are eligible to serve, and among them we find photographers distinctly mentioned. We cross to the furthest angle of the square, and at once the words "Photographic School" are recognized, painted up in plain letters upon one of the doors.

There is little need to introduce the courteous honorary secretary of the Photographic Society to our readers: anyone who has attended the recent meetings of the Society in Pall Mall is well acquainted with Lieut. Darwin, while his ability as a photographer, as everybody knows, has been more than once recognized by the Society. Captain Abney, R.E., F.R.S., was Mr. Darwin's predecessor as director of the chemical and photographic schools at Chatham, and the establishment certainly gives evidence of being thoroughly well organized and carried on. Lieut. Darwin's office is hung around by works of the School, and when it is remembered that this School has borne away several medals of the Photographic Society, it is not surprising to find here exhibited landscape work that is, in a word, second to none. Studies of foliage—secured, no doubt, in the adjoining Cobham wood—and pictures of grand old forest trees, appear to be the art productions upon which the School prides itself more particularly.

The Chatham School trains both officers and non-commissioned officers of Engineers in the practice of photography. No British army corps is complete now-a-days without its staff of photographers and photographic waggon. These military photographers are all trained at Chatham. Men who may be deemed apt learners are picked out of the corps and sent to the School for instruction. There is a chemical laboratory where they receive a rudimentary knowledge of photographic chemistry, at the same time that they are becoming practically acquainted with the art. The glass room is a magnificent apartment, measuring some 40 feet by 20, and has light in every direction except from the south. One of its main features is a copying table, which carries both camera and object to be copied, so that the whole may be bodily moved in the direction most favourable for the light. Here the young soldier receives practical instruction in wet and dry processes, and is able to work under the eye of an efficient instructor. The printing and washing rooms are adjacent, while the dark rooms are four or five in number. One of the latter, by the way, is employed as a camera for the production of large work.

The permanent staff of the School under Lieut. Darwin consist of three principals. Quarter-master Sergeant Doyle, who is, we believe, the chief, has charge of the vast collection of negatives stored here, and which number among them some valuable warlike records; he also directs the ordinary work of the military scholars. Quarter-master Sergeant Husband is the chief of the photo-lithographic department, a branch of the school which is very important, and which has been worked with much success; while the third non-commissioned officer, Sergeant James, is entrusted with the delicate operations connected with Lichtdruck or collotype printing. From this our readers will at once see the extensive character of the photographic operations carried on at Chatham, and the comprehensive way in which the art is made use of by the British army. Silver printing is, of course, largely practised; but both carbon printing and platinotype are resorted to, and, indeed, there is scarcely a new process brought forward in the photographic world whose merits have not been tested by one or other of the skilled photographers who supervise the different branches of work.

As we have said, no army corps is now deemed fit to take the field unless provided with a photographic equipment. Of late, a field electric light has been added to a general's command, and of this electric light our army photographers will in future make use. Experiments are at this moment being conducted at Chatham in connection with the copying of maps and plans by electric light, so that the staff of an army in want of duplicates of any map shall not have to wait long for them; provided with electric illumination, the army photographers hope to be able to carry on their work as well by night as by day.

Perhaps the most pleasing incident of our visit to the School was to learn of the high esteem in which the superintending non-commissioned officers are held by their superior. Serjeants Doyle and James have recently been working the heliotype process, and the examples of printing by this method are such as would draw down the encomiums of any connoisseur of photo-mechanical printing. Serjeant Husband also bears the reputation of being one of the cleverest photographers that the Chatham School has ever known.

Gelatine negatives are, of course, familiar objects at Chatham, and there seems little doubt that they will be chosen for work in the field. We had the opportunity of inspecting one of the field photographic waggons, and we say at once that its fittings were enough to provoke the envy of any landscape photographer. It is a vehicle

drawn by a pair of horses, the driver riding one of the animals, postillion fashion. Its cost must be considerable, for in every sense it is a vehicle *de luxe*. At one time its interior has the appearance of a well appointed office, at another it has the aspect of a chemical laboratory, with sink, water supply, &c., convenient to hand. The list of photographic requisites carried into the field by this compactly fitted vehicle would, of itself, fill two columns of this journal, and the only fault, if any, is, that the outfit provided is rather too comprehensive. A camera for copying, and another for landscape work, with a third for small views, find place herein, while the stock of glass plates is considerable. Not only is collodion in quantity taken, but supplies of pyroxylin too, for the manufacture of a further stock, together with a collection of every ordinary and extraordinary article that a photographer might require. But then it must be remembered that the army photographer has to rely upon himself for months together, and if stationed in the Khyber or at Jellalabad—as was the case with a staff of military photographers last year—no further supplies can possibly reach them. In the Abyssinian campaign, a staff of photographers marched the whole journey to Magdala—a distance of 400 miles from the point of disembarkation—and back again; and it is obvious that if their outfit had not been of the most complete nature, they could never have brought back the large and interesting series of views that still remain to us as an historical memento of the campaign. In all future wars photography will play a most useful and important rôle, and so long as the Photographic School at Chatham is carried on in the present spirited and efficient manner, we may rest assured that our military photographers will not be found wanting.

The "At Home" for next week will be "The London Stereoscopic Company at Regent Street."

ON A NEW ACTINOMETER.

BY LEON WARNERKE.*

I give the following shape to the apparatus intended to be used as a portable actinometer:—A is a circular disc $2\frac{1}{2}$ inches in diameter, in which phosphorescent material is hermetically sealed between two glasses, and kept in position by a wooden support. The brass tube, B, with the partition, C, is superposed over the disc, A; and by means of small screws and corresponding holes in the wooden part of the

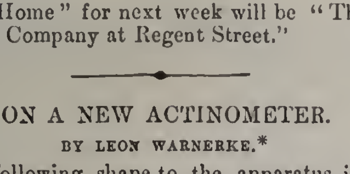


Fig. 1.

disc, A is so fixed that it can be caused to rotate. The partition, C, has a circular opening in it half an inch in diameter. There is also a lid D, hinged to the tube, B, holding a small magnifier or telescope, E, and indicator, G. The partition, C, is made in order that only a small part need be exposed to the action of light at each observation. The indicator, G, standing against a certain number printed on the rim of the disc, A, shows what part of the disc has been excited. The brass tube, H, is fitted inside the tube, B; it has a bottom, J, made from two discs of thin glass, between which is inserted semi-transparent material distributed in such a manner that to the observer, by transmitted light, it is visible as a series of circular discs of increasing opacity, and shows a light number standing in the centre of a dark ground. There are ten such numbered discs, two of them, L and K, having no numbers. L is obscured with some transparent material of green colour; K is perfectly transparent and colourless. Fig. 1 represents the actinometer as complete.

To use it the spring, F, is pressed, and the lid, D, is opened. The tube, H, which can be easily revolved, when acting on the projecting ring, is so placed as to have the disc, K, corresponding with the opening in the partition, C. Light can now freely act on the phosphorescent surface.

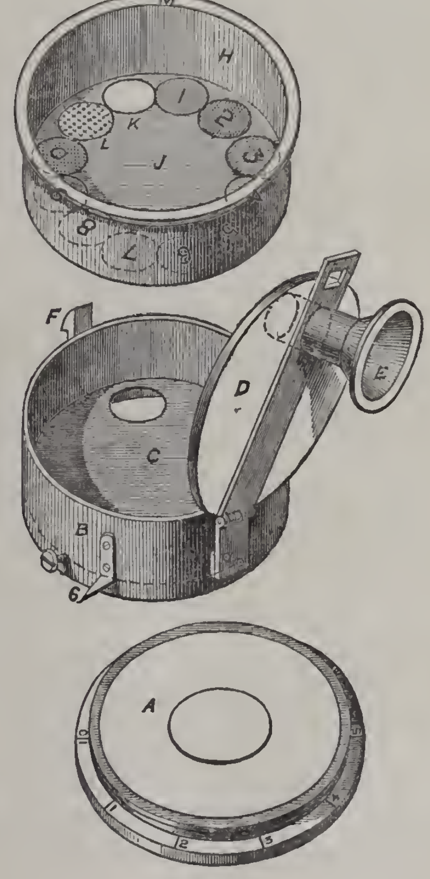


Fig. 2.

When the exposure is made, the lid, D, is closed, the funnel, E, of the telescope is made to approach as nearly as possible to the eye, and by acting on the rim, M, the tube, H, is revolved; consecutive numbers will then be visible through the telescope, but of diminishing intensity, till at last one is reached in which it cannot be distinguished. The last visible number naturally will indicate the intensity of the light.

When the next observation is to be made, owing to the persistence of luminosity of the portion previously used, it is preferable to use a fresh surface, and with this end in view, the wooden disc is revolved till the indicator, G, points to

* Continued from page 51.

the next number. Ten fresh exposures can be made by this means. If, however, the observations succeed so rapidly that after the last exposure the first portion of the disc is still luminous, we can resort to the extinguishing process; and this is done by exposing through the aperture, L, which is filled by the material capable of extinguishing the luminosity.

(*To be continued.*)

CLEAN NEGATIVES.

BY JOHN GARRATT.*

The production of clean negatives is one of those objects at which we all aim, and all alike at times find beset with difficulties, some of which I propose to examine as to their causes, and the remedies to be adopted with a view to their removal.

As I do not think that the familiar collodion process is by any means dying, although there are powerful rivals contending for that supremacy which it has long enjoyed, an evening spent in consideration of the subject brought before you may, perhaps, help us to arrange our materials, so that in the coming season our minds may be available for efforts to produce more artistic work, the production of which requires all our best energies, and is clearly impossible if we are in constant fear about the condition of the tools we work with.

We will suppose that every care has been taken to ensure cleanliness and purity in the preparation of the materials employed, and after collodionizing and sensitizing a plate we draw it out of the bath and drain. In due time we find the plate has lost a large amount of surface solution, and should be in a condition to be placed in the slide; but, unfortunately, at this early stage we find difficulties arise, as sometimes there are isolated drops of solution lying like tears on various parts of the plate ready to spoil our negative by obstructing the passage of light to the film, and also by providing an additional quantity of silver solution to mix with the developer, thus producing local action over which there is no control; or, it may be, there is a tendency to form greasy lines, which are not got rid by a prolonged immersion in the bath. Both these faults are the same in kind, differing only in degree, being caused by the repellent nature of the collodion. A collodion which is too etherial gives us this fault in perfection, in which case the remedy is to add some alcohol. If the fault proceed from the pyroxyline being very horny a drop of water may be added. I have sometimes added as much as five drops to the ounce, and succeeded in getting a good working article, though that quantity would ruin most samples of collodion.

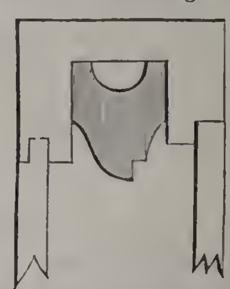
Having got the collodion into condition to drain surface dry without any action of a partial character, we place it in the slide, and, after exposure, proceed to develop—possibly to find a mass of stains and dirt. We were careful to wipe the back of the plate, so that silver solution after coming in contact with the steel or brass spring should not drain to the bottom; the slide was specially varnished, not forgetting the supports on which the plate rested; and some clean blotting-paper was placed in the well of the slide to absorb the solution which continued to drain.

When an electrician does not want electricity to pass from one substance to another, he places a non-conductor between them; when a photographer does want the drainings to pass from the plate to the blotting-paper, he also places a non-conductor between them in the shape of carefully-varnished supports which the drainings cannot pass.

In the meantime, the weather, perhaps, being hot, evaporation has taken place from the surface of the film, and the accumulated drainings, not having been allowed to be absorbed by the paper, are by capillary action going back up the film, when the evidence of progress can be found as soon as development is tried. Here, I believe, is to be found the true explanation of matt stains, oyster-shell markings, or whatever name they may be known by.

As it is clearly impossible that very much time can be allowed for the plate to drain, we must make such preparations as will allow the process to go on in a harmless manner after the plate has been placed in the slide.

It has long been a conviction on my part that in the matter of slides efficiency has been sacrificed to lightness of construction. In most cases an additional space from the back to the front of the slide, whilst making it much more serviceable, would not be any drawback; indeed, for studio work none would be felt if they were double their usual thickness, as it would afford a better chance of placing the supports and plates in a position more favourable to the production of good work. The common plan is to put silver wire to prevent actual contact of the film and the woodwork; but it only separates the two by a distance much too small, as the drainings often find their way into the shutter groove, and, besides being squirted all over the film, soon destroy the slide. Some years ago glass corners were introduced, and by many hailed with delight, as putting an end to all such troubles as stains, &c.; but I believe no practical benefit was ever found in their use, simply because they were a non-conductor where a conductor was wanted. The diagram is a section of



what a slide ought to be, the shaded part being an ebonite support let into the well of the slide. If the support is filed into shape, and left with the toothed texture that the file gives, it will be found to offer no great impediment to the passage of the drainings, especially if moistened before beginning work. If the supports were glass with a ground surface they would offer, perhaps, the best conditions that could be secured. It will be seen that any drainings necessarily find their way into the well, and cannot get into the shutter groove.

I have used slides fitted on this principle for about ten years, and find them quite satisfactory—such a thing as a matt stain being a rarity, and then only if I neglect to remove the blotting-paper when saturated, which, it is obvious, should be done. The slides I have used have all been converted ones, and in no case originally made on that principle; consequently, not offering the best possible conditions, as they are rather thin for the purpose. With these precautions our difficulties should, in a great measure, be got rid of.

In steering away from one difficulty it is often found that we run against another, so by the addition of alcohol to collodion, although one difficulty is lessened, if too much be added we may find that the image is coarse in texture; it is, therefore, necessary to guard against overdoing it, and to operate only upon small quantities, so that if our efforts are too vigorous a ready means is at hand to correct the mistake.

An occasional difficulty is a number of little black spots upon the negative, which can frequently be traced to the falling of minute particles from a white-washed ceiling,

* Read before the West Riding of Yorkshire Photographic Society.

evidently suggesting the use of paper for the tops of dark rooms. When not from that cause, and there can be no suspicion of alkalinity of the bath, the use of a minute quantity of hydrochloric acid in the collodion will not only get rid of them, but also will generally be found a perfect cure for a much more serious trouble—a shining, metallic deposit under the film, which frequently causes a negative film to split up before it can be varnished, especially if it be the portrait of a child or anything which it is difficult to get well exposed, and, consequently, requires forcing in development. The same fault is frequently got rid of by the addition of chloride of calcium—about half to one grain to the ounce.

Another fault frequently met with is the coarse nature of the deposit, which sometimes is so bad as to look as if it had come out of a pepper-duster. The cause is usually one that is not readily suspected. We are accustomed to look upon the spirit added to the developer as possessing only mechanical properties, and in the matter before us ignore it in our search for the origin of the defect. We try a fresh sample of collodion; and though it may, perhaps, show some slight improvement, the fault is still there in strong force. Next a change of developer is tried—no improvement; then the bath is suspected, and, as a new bath is accompanied with a new developer containing no spirit, we are at last in a happy frame of mind as the enemy is vanquished, and to avoid further trouble the offending bath is added to our waste for recovery. A new bath soon ceases to be new; so to get the developer to flow some spirit is used, and now the game is once more started to become stronger with each new lot of developer, unless some lucky broom should fortunately knock down the spirit bottle, when a fresh sample is got and may happily work well.

For the production of clean negatives, therefore, I should say that cleanliness and purity of the substances employed are essential; the collodion employed must not be repellent of watery solutions; and, above all things, good drainage of the plate, taking care that nothing shall be allowed to go back again on to the plate. Also the alkalinity of the collodion must be guarded against; but, if it be necessary to add acid, it must be done with great care, a small quantity being added, dissolved in pure spirit for convenience of use, and after waiting an hour or two a plate should be tried. If sufficient be added to produce the effect at once, the operator will probably find in a short time that he has wasted his stock. Lastly, see to the frequent evaporation of the bath solution, so as to avoid the necessity for spirit in the developer.

PREPARING GELATINE PLATES.

BY JOHN MATTHEWS.

The process of preparing gelatino-bromide plates which I found the easiest and most simple is the following (it is, indeed, the only one in which my efforts have been crowned with success). However, that speaks more for my want of skill than any defect in the other processes, for many good men and true have apparently succeeded with them; but as my failures would interest few people, I give the one I believe I have mastered—at any rate, the one which produces me good results. The following is the formula I employ:—

Nelson's No. 1 photo. gelatine	...	10 grammes
Ammonium bromide (pure)	...	8 ,,
Water (distilled) ...	... ...	280 ,,

I put these into a large bottle, and in a short time the gelatine becomes swollen, and the bottle is put into a warm water bath, and there agitated until its contents are dissolved. This I sensitize by adding to it—

Nitrate of silver	... ...	12 grammes
Distilled water...	... ...	50 ,,

When this is dissolved I pour it with the other, a little at a time, shaking it up well. When all the silver solution has been added, pour into it 1 drachm 25 minims of pure ammonia, and shake the solution up again. The ammonia renders it quicker in its sensitizing, and prevents it decomposing. After the above has been done I pour the solution of gelatine into a porcelain dish, and place it in my sink in the dark room to set. When it has set I detach it from the dish and place it between one or two thicknesses of muslin, and wring it so that the gelatine is expelled in shreds, which I easily wash through a fine sieve of muslin. A washing of five hours in water three times changed I find is sufficient. I then collect the pellicle on a clean linen cloth, and dissolve it at a temperature of 95° Fahr. It is then ready to coat the plates with.

This is the formula that was given by Dr. Van Monckhoven to the Belgian Photographic Association, and since its publication it has been my favourite process. I have rarely failed with it, and when I have, it has been through carelessness in not correctly following the directions. All my operations of mixing the various preparations I do in my darkroom. I am then perfectly sure that I am on the safe side, whatever occurs. From mixing the gelatine with the bromide, to conveying the solution after "cooking" into another apartment to coat the plates, it is never out of the dark room. The only time that I had the gelatine decompose was on an occasion when I had omitted the ammonia. This adding of ammonia undoubtedly has an effect in rendering the emulsion more sensitive. I never cook it more than three or four days, sometimes not so much, and I find it gives me pictures exceedingly quick, equal to some of the most rapid commercial plates. I am very fond of this formula, and think it is just the thing for an amateur. When it has done "cooking," I convey it, well covered up in an earthenware coffee pot, to the room where I coat the plates. I have a large negative box full of these, well dusted and slightly warmed, on a long deal counter which I had made for the purpose. I stand the plates on one end of the table, and at the other end I place a rather tall lens cupboard, which I have had fitted up with shelves between these two; with a spirit level, I level a large sheet of plate glass, by the side of which I place a glass rod. Now I am ready. I carefully note that every little crevice is carefully stopped up to exclude the light, and I light my lamp (this lamp has only a front glass to show the light, I having carefully gone over the other side with Bates's black varnish); the front I first stained with ordinary negative varnish, considerably impregnated with iodine, and then with a very good sort of orange varnish a painter forgot to take away from my house after decorating operations. In front of this lamp, also, to make sure, I place a piece of ruby glass, and I turn on very little gas. My plates are just warm, and I pour on the emulsion, aided with my glass rod, without the slightest difficulty. As I do them, I place them on my levelled plate glass, which holds fourteen half plates. In a very few minutes they are set, and I place them on the shelves in my cupboard, which are lined with common filter paper. This prevents them sticking to the shelves from the cause of a little going over the back, which was the case in two instances, I having only got them away in pieces with the aid of a chisel and hammer. After I have placed them in the cupboard, I cover it up with two large tablecloths, and for twelve hours, in dry weather, I keep a gas stove lighted up in one corner of the room; longer in damp weather. I very seldom find that these plates want intensifying; this I attribute to my using plenty of pyro in the development. On those rare occasions when they do require it, I dip them in a small glass dish containing a solution of the following:—

Bichloride of mercury	... ...	80 grains
Iodide of potassium	... ...	100 ,,
Water	... ...	3 ounces

Sometimes just dipping them in this for a few moments will be sufficient, but I very rarely want to intensify them; I always avoid it if possible, and with proper care in the development I believe it can be avoided.

The Photographic News.

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ON THE CHOICE AND TESTING OF LENSES.

We have received communications on this subject from three correspondents within a week. One of them volunteers to send up his lenses all the way from Scotland, in order that we may pass judgment upon them; another asks us for an opinion on the instruments of two famous makers; and the third, desirous of buying a lens for copying, wants to know how he is to choose from the four that have been sent him.

There is hardly a subject on which so many diverse opinions exist among photographers as upon that of lenses, and these opinions are not confined to this country and this country's manufactures. An eminent firm in Regent Street attributed a good deal of their success as portraitists to the fact that they possessed a good series of lenses of Vienna make with the well-known name of Voightländer upon them; while we ourselves, during a visit, some twelve years ago, to Herr Angerer, the court photographer of the Austrian capital, were assured that the possession of "English lenses" had much to do with the production of the charming "cabinets" that made the name of Angerer so famous shortly before the star of Fritz Luckhardt had risen. The late Mr. Crawshay, of Cyfarthfa Castle, whose landscape work and portraiture took such high rank, used scarcely any other but Dallmeyer lenses, and Mr. J. H. Dallmeyer enjoyed the privilege of being a sort of privy councillor to the "Iron King," a position, we believe, both of honour and emolument. On the other hand, a most successful photographer, whether tested from an art or commercial point of view, Mr. J. E. Mayall, ex-Mayor of Brighton, swears by Ross, and no one else. His huge lens for enlargements was built by Ross, and so are the instruments Mr. Mayall employs for his astronomical work. Again, who will say that the name of Grubbe—especially in connection with landscape lenses—is not highly honoured by photographers? We knew a veteran sergeant-major of artillery, who was an accomplished landscape photographer, who used constantly to talk about "old Grubbe" (by which he meant the lens, and not the maker) with a degree of affection amounting almost to maudlin sentimentality; while another photographer of the same military school, but with more of the martinet and warlike bluster about him, always had a sovereign remedy for ills in the form of a "Dallmeyer's Triplicate," for which he invariably shouted in a strait, premising that so valuable an instrument could not possibly be called by so short a name as triplet.

Mr. Valentine Blanchard has given a sound word of advice as to the choosing of portrait lenses. He holds that a good instrument is one that does not require stops in order to give a perfect picture. Indeed, we have heard him express a dictum that he would never employ a lens that did not answer this test. Here, then, is one wrinkle that some of our correspondents may be glad of. Of course, in testing a lens, the work it is destined to perform must always be had in view; if it is sold by the maker as a lens that will take portraits of cabinet size, we cannot expect it to cover a larger area, or even give perfect definition down to the edges of that size, without a stop, unless the manufacturer definitely says so. But every maker of acknowledged standing tells the capabilities of his work, and these may be tested by any buyer.

There are two ready modes of testing lenses that have been known to us for some time. They are neither of them very scientific; but since they are advocated by men of skill and experience—and we ourselves have derived assistance from them—we mention them here once more. The first is to aim the lens at a kind of target, which has a bull's-eye, a centre, and any number of outers. The markings on the target are, in fact, a number of squares—one within the other. These rectangular figures are all ruled with the same metal pen with Indian ink, so that the lines are black, and all of the same thickness. In one studio with which we are acquainted this target is affixed to a drawing-board which is permanently stationed at one end of the studio, the board serving to fix up any drawings or designs that have to be copied by the camera. A pair of rails on the studio floor enable a table with a camera to run up towards this drawing-board, and, therefore, the trying of a lens at any time is a very simple affair. If there is any doubt which of two lenses covers best, distort least, or have the largest field, the question is rapidly set at rest by taking a picture of the target. The squares one within another being mathematically correct, the photographic result enables one to judge in many ways of the capacity of a lens. A rapid lens will not, of course, give such definition as a slower lens, other circumstances being equal; but the production of a linear picture of this kind will be found, nevertheless, a very good test of rapidity.

The other plan is one practised with good effect by Professor Hermann Vogel, of Berlin, and who described the arrangement some years ago in these columns. He found it very useful for testing many photographic phenomena. He sets up a white bust—of Apollo, in his case—and hangs black drapery about it. He secures in this way high light, half-tones, and deep shadows, and the arrangement is one that any photographer could fit up at small expenditure of time and money. This bust-model is particularly useful in testing portrait lenses. All the instruments to be examined are directed from the same stand-point, and plates taken by their aid will not only indicate, by the coming up of lights and shadows, which are always constant, the rapidity of the lenses, but the pictures, by showing more or less of the curves of the face, a heightening or lowering of the forehead, and by the general modelling afforded, will furnish evidence which can hardly be recorded in any other way. The bust should be of large dimensions, and some care taken in adjusting the black cloth behind and at the side to conjure up shadows of all depths. Its cost—for any plaster cast will answer the purpose—is exceedingly small, and a spare dark cloth answers the purpose of drapery. Altogether, Dr. Vogel's bust arrangement is an excellent standard for photographic tests of many kinds, and any of our readers desirous of making experiment with lenses, collodions, sensitizing salts, developers, &c., will do well to bear it in mind.

Of course, any trials of the nature we have mentioned must necessarily be imperfect; but for most practical purposes we have no hesitation in recommending the above to our brother workers.

Notes.

Prince Leopold is a good chemist, and has a practical knowledge of photography. He was this week elected a member of the Royal Institution.

In France, they say something about *les jours se suivent, mais ne se ressemblent pas*; but with us, with the London fogs about, the days are very much alike indeed.

A series of photographs were taken at the Cape by H.R.H. the Duke of Edinburgh, when he visited that Colony as a naval officer some years ago; but of late the Prince seems to have abandoned the camera altogether for the violin.

A photographer sends us kindly greeting, and forwards an order upon his studio to be photographed in a "memorial" of eminent personages. We subjoin the ticket, and shall be glad to place it at the disposal of any of our readers who may be passing that way, and is willing to represent us. "Memorial Ticket.—This invitation entitles Editor London Photographic News to a complimentary sitting for a photograph for the memorial. And, after you have read the above, if you wish to participate you will confer a favour by calling at my Gallery, 125, State Street, for a sitting without being personally solicited, as that incurs unnecessary expense, in time and money, and for the love you have for your children's children, and the interest they will take in the offering in after years, you cannot afford to be left out, as it costs you nothing." We should mention, by the way, that the address is Chicago.

Mr. Fry, as we know, has been complaining of the German pyrogallic acid, which, he says, is cheaper than, but inferior in reducing power to, that made in England. Dr. Vogel, always anxious to break a lance in defence of the Fatherland, has been experimenting with the two acids, and comes to a directly opposite conclusion. He took a sample of pyrogallic acid obtained from the celebrated photographic chemists, Messrs. Hopkin and Williams, of London, and another of Messrs. Schering, the no less celebrated chemical manufacturers of Berlin. Testing the two under precisely similar circumstances, he found that the English acid reduced $74\frac{3}{8}$ per cent. of the silver bromide employed, whereas the German acid effected a reduction of $78\frac{1}{12}$ per cent.

Professor Steinhauser, of Vienna, has recently been studying the stereoscope from an optical point of view, and his conclusions appear to be (1) that all stereoscopic pictures should be taken with lenses of equal focal length; (2) that the pictures should be made of equal breadth, or about three inches; (3) that the distance between the centres of the lenses should always be kept constant.

Becquerel's phosphorescent powders appear to be making way. A surface painted with these and exposed to light remains luminous for some hours. Our readers have no doubt seen the luminous clock dials which are now general. The manufacture of the phosphorescent powders is still a secret, but they are the sulphides of barium, strontium, or calcium treated in a certain fashion.

Mr. Baden Pritchard has found that a piece of cardboard six inches square, treated with the phosphorescent compound, and exposed to light, will, when brought into the dark room and placed face to face with a gelatine film, produce an image within the space of thirty seconds.

The makers of the phosphorescent powders propose it for painting the interior of railway carriages, so that their walls may emit light when a train passes under a tunnel; by this device there would be no need for lamps, at any rate in the daytime, when the phosphorescent walls would be continually being resensitized. Another proposition is to light up the hold of a ship; in this case there would be two phosphorescent screens, one in the hold emitting light, and the other on deck absorbing it. Every half hour they would be changed, the old screen sent up into the daylight, and the new one drawn down below. At present, however, these schemes are *in nubibus*.

Dr. Gerhard Rohlfs, the well-known African traveller, and the first to avail himself of photographic aid when exploring the Libyan Desert, has been personally decorated, by the King of Italy, with the Order of the Crown.

It was Herr Remele, it may be remembered, a Berlin photographer of note, who accompanied Dr. Rohlfs to the Libyan Desert. Herr Remele tells of an incident which is interesting, both to show the clear transparency of the atmosphere, and the vicissitudes of African travel. Moving homewards, the caravan, both men and beasts, was well nigh demoralized by their daily toil over the hot sands, one march succeeding another in unbroken monotony. The eye, for ever straining, saw nothing but the flat level of interminable sand. Suddenly one morning, a shout of joy arose from the ranks, and the listless travellers became in a moment the most energetic and vigorous of men. Before them was a small black cloud, smoke emanating from a sugar bakery they knew to be upon the banks of the Nile. But so clear was the atmosphere that it was not until the afternoon of the morrow that the caravan arrived on the spot itself.

An exhibition of inventions and patterns protected by German patents and registration is to be held in Frankfort-on-the-Main, from May to November, 1881. Connected with it there will be horticultural and photographic exhibitions, and also one of printing.

A trade exhibition is to be opened at Düsseldorf in May of this year. Photography, according to the present intention of the managers, will occupy a prominent position.

Stanley, the finder of Livingstone, provided himself with a camera and a goodly supply of dry plates ere he started on his last African exploring expedition.

Everybody knows that surgeons use large quantities of collodion in practice, but it is not so generally known that a great deal of the bromide and iodide of potassium that is made finds its way to the doctors. The salts are employed for bronchial and nervous affections.

Professor Rosetti finds the temperature of the positive pole of the electric light is about 3900° Cent., the negative pole 3150° Cent., whilst the arc itself is 4800° Cent.

Mr. Bolas, F.C.S., in the first of his Cantor lectures at the Society of Arts on Monday last discussed the "Manufacture of India-rubber and Gutta-percha."

Mr. Carr's paper at the Society of Arts on "Arsenical Poisoning" was thoroughly practical, and, it is hoped, may lead to practical legislation on the subject.

In our own experience, an analysis of some fifty specimens of wall papers showed that nearly ninety per cent. were contaminated with arsenic. They were the more expensive paper chiefly of the light grey, brown, and green tints. The arsenic was generally abundant.

A correspondent last week drew attention to the possibility of photographing the fine scenes in our pantomimes and burlesques by the aid of gelatine plates. Should any of our readers try the experiment we fear they will be woefully disappointed over their pictures. Before the Surrey Gardens was destroyed, with its lake and pasteboard city of palaces beyond, a photograph was secured of the scene. To the eye, especially under certain aspects of the sky, the effect was exceedingly good, for the mansions and minarets of the city harmonized very well, and appeared uncommonly real in the hazy distance. But the camera was not to be humbugged, and in the photograph the deception was of the most puerile nature, the gay city appearing what it really was—a cardboard silhouette against the sky. So in the scenes of a theatre, the tinsel lines would be shown with terrible sharpness, and the daubs of the brush made painfully apparent.

We are glad to hear that Messrs. Mawson and Swan's stock of collodion was not materially affected by the late disastrous fire. Happening to be at Newcastle some years ago, we were permitted by Mr. Swan to have a peep into the storehouse where he kept his collodion. It was an apartment with a cellar-like coolness about it, huge glass vessels of collodion standing in rows on shelves one above the other. We do not know the quantity in the storehouse, but it must have been several hundred gallons. Mr. Swan explained that one of the principal features in collodion making was to keep it in a perfect state of quietness for a considerable time, in order to allow a complete deposition of the insoluble fibres. The vessels stand for months together, in order toallow the liquid to become clear, and then the utmost care has to be taken in decanting it.

In the *Photographische Notizen* Professor Vogel gives a dodge for mounting large pictures. When the mounting board is placed flat on the table, even a bookbinder—and few photographers have served an apprenticeship to that trade—would find a difficulty in pasting the photograph on to it; but by fixing the board to a door in a vertical position with a couple of drawing pins, and then hanging the sheet to be mounted by the corners, also vertically, over it, the latter can be smoothly and easily attached to the cardboard.

FRENCH CORRESPONDENCE.

Gallate of Iron Process by M. Colas—Photographic Prints Transferred to Raised Surfaces by M. Pinel Peschardiere—Process by M. Hennetier for Producing Enamelled Pictures on China and Porcelain—Actinometry from a Photographic Point of View.

Gallate of Iron Process by M. Colas.—At the last meeting of the Photographic Society of France, M. Colas showed some prints taken from line drawings, in which those drawings were reproduced in black lines on a white ground. These are the results of a process analogous to that worked by the house of Pellet and Co., with their so-called *cyanofer* paper—but with this difference, that while in the Pellet process the lines are rendered in blue on a white ground, in that of M. Colas they are formed by gallate of iron, which, as is well-known, is the basis of ordinary writing ink. The method which M. Colas ingeniously employs is by no means new, and indeed he does not lay pretension to having invented it. Some years ago, prints were taken on paper impregnated with perchloride of iron, and exposed to the light under a photographic positive, in the presence of a solution of gallic acid; under the action of the luminous rays the perchloride of iron is decomposed, but the salt remains stable in those parts that have been protected from the light by the dark lines of the positive. Where it has not suffered decomposition, the perchloride of iron combines with the gallic acid to produce gallate of iron, a compound which, when the reaction is complete, is of a brownish black colour. A simple washing in water finishes the operation, and the print is found to be quite fixed, and of sufficient durability to withstand the action of a long number of years. I cannot speak of this process from experience, as prints have not yet been taken by it for commercial purposes; but it seems to me that a probable difficulty will be found in the length of time required for light to convert the perchloride into the protochloride of iron. It must, however, be confessed that my experiments were carried out during very dull weather; it is my intention to repeat them when I can ensure a clear sky, so that I may be able to arrive at correct conclusions. The idea is, no doubt, in itself a good one, and the manipulation of the process is perfectly simple; there is therefore reason for hoping that, when applied on a commercial scale, it will add another to those methods of photographic reproduction with which our art is already endowed. Working in the same direction, M. Pellet is endeavouring to realize prints in black lines on a white ground, by taking advantage of the property which, as M. Poitevin pointed out, gelatine possesses, when rendered insoluble by a mixture of iron perchloride and tartaric acid, of becoming soluble under the action of the luminous rays. This property may, in my opinion, be also utilized for the production of lines in gallate of iron. The way I should proceed would be to impregnate a sheet of paper, previously lightly coated with gelatine, with a mixture of iron perchloride and tartaric acid, to insolate it, and then to plunge it in warm water; afterwards I should brush it over with gallic acid, and finally rinse it in spring water. This chemical reaction appears to me to be more easily effected than to dissolve gelatine that has been already charged with sufficient ink to render clear and well-marked lines. We have the choice between these two methods, and there can be no doubt of their being very soon realized.

Photographic Prints Transferred to Embossed Surfaces.—A few days ago I had an opportunity of examining some attempts of M. Pinel Peschardière to coat porcelain or enamel reliefs with tinted and photographic drawings, which were afterwards to be fixed by burning in. The process is the same as that of usual vitrification, with the important difference that the image is first produced in a metallic oxide on a pliable support, and afterwards trans-

ferred to a relief already prepared, instead of to a plane or a more or less curved surface. A design in relief is first executed in the plastic material, corresponding exactly in size and outline with the coloured image on the pliable support; when the latter is transferred to the former the effect is to heighten the modelling of the relief by the addition of colour and gradation to the shadows. As yet it is impossible to say whether this process can be made industrially successful, for it is still in a state of infancy.

Enamelled Pictures on China and Porcelain.—Another inventor, M. Hennetier, has conceived the idea of filling up the hollows on the surface of porcelain or china with a flux coloured by metallic oxides; these hollows are produced by means of moulding from a photographic print on gelatine. In a word, he produces on a gelatine surface protuberances and depressions by some such photographic process as that of M. Poitevin in his method of *Helioplastic*, or by the various methods employed by Mr. Woodbury in the printing process known by his name. M. Hennetier takes a reversed impression of the gelatine matrix in fine plaster of Paris, and then prints this cast on to the clay or kaolin while in a plastic condition; so soon as the impression thus obtained is hardened, he separates it, and in this way he gets a sort of semi-transparent picture in which the image is formed by the more or less deep depressions in the porcelain or china. He then applies a kind of varnish coloured with various metallic oxides to these depressions, and submits the whole to the furnace. The coloured flux fills all the hollows, and according as they are more or less sunk will be the greater or less depth of the colouring material. Thus a picture in enamel is produced similar to the print obtained on coloured gelatine by the Woodburytype process. There is certainly much to be said for this idea, though I scarcely think it contains anything capable of direct application. The great defect of this method of working is the veil of colouring material, which spreads uniformly over all the lights of the picture, so as to produce nothing but a monochromatic cameo, and this, of course, spoils to a certain extent the details, whose significance is confused by the tint of the coloured varnish. It would, therefore, be better to employ only one flux, but slightly charged with colouring material, and in certain parts, where the relief is most prominent, to wipe off the superfluity, as is done in copper plate printing, before exposing it to the furnace.

Actinometry from a Photographic Point of View.—The very interesting treatise by Mr. Warnerke on actinometry and actinometers induces me to recur to a question to which I at one time gave a large amount of attention, and in the importance of which I am now more than ever a believer. According to the conclusions of the respected and learned author of this work, there is no photometer at present existing on which complete reliance can be placed for photographic work. He is certainly quite correct in this conclusion, and I should be the last to dispute the truth of his assertion. I am also far from wishing to advance any proposition which can be construed as being contrary to his views; only, I desire to submit whether it is absolutely necessary to work to an exact photometric standard in the majority of operations in which we engage. I quite admit the necessity for extreme accuracy in actinometric experiments, like those of Becquerel, Marchand, Roswe, and others, whose object is to measure the chemical intensity of light. In cases of this kind scientific accuracy cannot be too strongly insisted on, and I can quite understand the dispute that has arisen between M. Marchand and M. Becquerel as to different methods of observation leading to results not marked by that coincidence which alone ensures scientific truth. The art of photography, properly so called—that is to say, the industrial art which makes use of certain discoveries of science in order to attain practical results—can as easily dispense with absolute precision in photometry, as a mason can do without a standard yard for measuring his work.

LEON VIDAL.

Topics of the Day.

PORTRAITURE WITHOUT A STUDIO.

BY H. P. ROBINSON.

NEARLY the last words written by our late much lamented Editor were to the following effect:—"The subject of portraiture without a studio involves too many considerations to be treated satisfactorily within the limits of an answer to correspondents. We hope to devote an article to the subject, giving the best advice we can offer." The information and advice thus promised I shall here endeavour to supply.

Previous to the advent of gelatine emulsion plates—the marvellous rapidity of which enables the photographer to easily succeed with subjects and under circumstances hitherto deemed impossible—"portraiture without a studio" would simply mean taking portraits out of doors, with all the manifest inconveniences and discomforts such conditions imply; but now that more rapid plates have rendered brilliant illumination unnecessary, portraits can be easily taken in a room, the only light required being that of an ordinary window. Nor need the results be in any way inferior to those taken in the best appointed studio—indeed, I have seen portraits and groups taken in a room that were superior to much of what is called "the best work;" one of the reasons for this superiority being, perhaps, that they were less conventional than the usual studio pictures.

There is another reason why satisfactory results can be obtained in an ordinary room—there has been a great improvement in taste of late years. A greater variety of lighting is now allowable than in the early days of photography, when the head was expected to be nearly evenly lighted, enough shade only being admissible to give relief and roundness; and a flat, plain background was imperative. It used to be an axiom with some photographers that if there was a spot of high light on the forehead and down the nose the lighting was right, and every other quality was sacrificed to this curious notion. Now, anything is permitted, and, if well done, admired, however it is lighted, whether the face is full of delicate gradations, or nearly black, as in some of the exaggerated so-called Rembrandt effects. We will now consider the various kinds of effects that can be produced in this manner.

Perhaps the easiest kind of portrait to take by the light of an ordinary window is that in which the head and shoulders only appear. It frequently happens that sufficient space is not to be obtained to enable the camera to be placed far enough from the sitter to include a full-length or three-quarter figure; a head, then, is all that is possible. The best kind of room for our purpose is one with a large window on one side, and a smaller one at right angles with it. In a room of this kind it is almost impossible to light the head ineffectively. The sitter should be placed near the large window, and the blind of the small one should be so arranged as to admit sufficient light to soften the shadows. It will be found that almost any modification of light and shade can be obtained by this arrangement. When the use of a second window is not to be had, the shadowed side of the face may be much softened by the aid of reflectors; an efficient and easily-managed reflector may be improvised with a clothes-horse and a sheet, or with a screen covered with white cloths or paper. Another method of getting a delicately-lighted head without the use of reflectors would be to place the sitter in the room at a distance of ten or twelve feet from the source of light, and place the camera near the window, looking across the room diagonally at the subject.

Bold and startling effects of light and shade are perhaps more easily to be obtained in a room than in a studio, and often suggest themselves. Rembrandt effects, and all kinds of shadow pictures, are not only possible, but can be produced with very little trouble, care being taken in turning

the lens—as will be necessary for shadow portraits—towards the window, to protect it as much as possible from the direct rays of light, especially when very sensitive plates are employed; it must always be remembered that the lens acts to some extent as a window, as well as a condenser and refractor.

When the room is large enough there is no reason why very effective groups may not be made. A group of figures sitting in a room at their various occupations would be much more natural and pleasing than the usual pile of people, which seems to be nearly the only way in which photographers can arrange several people together. I don't say there should be no arrangement; I don't believe in anything being successful when done in a hap-hazard way; but there is more scope for natural arrangement in a room than before a six or eight feet background. Neither with gelatine plates should there be the usual difficulty about getting all the figures into focus. It is not at all necessary to use a portrait lens of wide aperture for the sake of getting all the light possible. It will be found that landscape lenses, or such a lens as the rapid rectilinear, will afford a sufficiently short exposure, and will cover the plate without confining the focus to one plane.

In indoor portraiture it will be often found that the natural background will be the best; but one or two things should be avoided, and others it should be the object of the photographer to obtain. All spotty lights and patches should be avoided. For instance, a framed engraving with broad white margin would have a very distracting effect if it came behind the head, so also would a white marble chimney-piece or a shelf containing porcelain; but if any of these could be shaded and subdued there would be no objection to them; variety of form and tone in the background give a great charm to the picture.

Many of the new wall-papers make good backgrounds, but violent patterns should be avoided. There should be nothing loud in the composition or chiaroscuro. A knowledge of art has become so general amongst photographers, that it is perhaps unnecessary for me to insist so strongly on these things; I will therefore only say that the endeavour should be to avoid flatness, and to produce a variety of light and shade behind the head. Nothing has a better effect or gives so much relief as a background that comes dark behind the lighted side of the head, and light behind the shadowed side. This effect is easily produced by the arrangement suggested by Mr. W. Sawyer in the Year-Book.

A simple two-leaf screen is placed behind the sitter, the light from the window falls on the leaf behind the shaded side of the head, leaving the other leaf in dark shadow. This is the best make-shift arrangement I know; but there can be no doubt that a properly painted and graduated background is better than any other contrivance that can be devised, because it enables the photographer to place his light and shade exactly where it best suits his endeavours to get breadth and pictorial effect.

[The topic for next week will be "The Platinotype; its Chance of Permanence," by John Spiller, F.C.S.]

Correspondence.

BACKGROUNDS.

Dear Sir,—Looking over this year's Year-Book, I find on page 102 an excellently-written article on "Backgrounds," by P. Tagliacozzo. That gentleman asserts that the lightest part of the background should be so placed as to relieve the part of the face in the deepest shadow. I must state I quite agree with his views; but for those who do not possess graduated backgrounds the following will be found to answer admirably. Paste a fine piece of tissue paper at the back of the negative, and work with powdered crayon, or BB pencil, over the tissue paper, gradually softening it out, where you require the background to print the deepest. A piece of chamois leather placed over the finger is suitable for softening. You will be able to get any desired effect, which will greatly add to the beauty of the photograph. The best-painted background could not give you a better effect than the above method.—Yours truly, A. Clark, Jun.

DEVELOPMENT OF GELATINE PLATES.

Dear Sir,—If any of your readers who develop gelatine plates will try the bromide of ammonium in the developer, instead of the potassium bromide, they will find the result far superior.—Yours respectfully, H. Spink.

[Bromide of ammonium is generally used.—Ed.]

PHOTOGRAPHY IN BED-ROOMS.

Dear Sir,—Seeing that your correspondent "Yaulif" is surprised at the possibility of securing good photographs in "sitting rooms," I herewith send you a cabinet photo. of a child which was taken by myself in a very small bed-room, with a window only four feet by five feet, facing north; five seconds' exposure with Solomon's J)(S carte lens on a Wratten plate; and as I am only a very young amateur, I beg your "gentlest reproof" in case it is not worthy of your inspection. Rellim Nuj.

[The picture sent us is more than good.—Ed. P. N.]

Proceedings of Societies.

West Riding of Yorkshire Photographic Society.

We subjoin the annual report of this Society to which we alluded in our last.

"In presenting the fifth annual report the Council have pleasure in saying that the Society still displays a fair average amount of energy amongst its members. There has not been that eagerness in the production and reading of papers that the Council would like to see; but, as that seems to be the normal condition of most societies, it is, perhaps, not a matter for much surprise.

"The papers read have been as follow:—'Art Typography,' by Mr. J. Crosthwaite; 'Albumenising Plates,' by Mr. Wormald; 'Light, Shade, and Composition,' by Mr. J. Crosthwaite.

"A lantern exhibition, by Messrs. Burrow and Howarth, gave great satisfaction to all present.

"The other meetings have been conversational, and not confined to any particular subject; but they have been of a most enjoyable character.

"The attendance has averaged about the same as previous years. There has been no important reduction in numbers, and a few members have been added. A more punctual attendance at the meetings would conduce very much to the Society's success; and a little more energy in discussing the papers and miscellaneous subjects introduced would make the meetings more interesting and valuable as a means of education to the members generally.

"In conclusion, the Council beg of the members to use increased diligence in promoting the interests of the Society, by contributing papers, exhibiting objects of interest, and in every way furthering the objects for which the Society was formed."

Mr. J. Garratt read a paper on "Clean Negatives" (see page 64).

Mr. J. Smith (Halifax), in proposing a vote of thanks to Mr. Garratt, said that on the subject of the paper his experience had been, he imagined, like those of many others, very erratic, the result varying at different times. There were many remedies that were valuable to some workers, but which, at the same time, were found by others to be quite erroneous. The best remedy he had found for greasy lines and tear-drops was to alter the condition of the collodion. There were, he remarked, many things in photography that were by no means easy of explanation. They might succeed to-day and fail to-morrow. A different mode of manipulation would make a marked difference in results: in addition to which the chemicals used varied, and

ninety-nine out of one hundred photographers took them on the veracity of the dealer, having no other knowledge or guarantee.

Mr. Cook did not think the solution running back would injure the plate, but it was the foreign matter carried with it that did the mischief. He found the best remedy for preventing the drying of the plates was to add bromide of magnesium to the collodion, as it produced in the film a deliquescent salt, and kept the surface moist and homogeneous.

A vote of thanks to Mr. Garratt was carried, and the meeting was adjourned.

Liverpool Amateur Photographic Association.

The monthly meeting was held on Thursday evening, the 29th ult., at the Free Library, William Brown Street, Mr. J. H. T. Ellerbeck, President, in the chair. The minutes of the annual meeting were read and confirmed, and Mr. Arnold Cleaver was elected a member of the Association.

The President then read an inaugural address, which, with a paper on "A New Rapid Shutter," by Mr. W. Horseman Kirkby, reaches us too late for insertion in the present number.

Some results of experiments of various qualities of light upon extra sensitive bromo-gelatine plates by Mr. Cussons were exhibited, and a vote of thanks to that gentleman was awarded for his kindness in sending them, and also for the supply of almanacs he had forwarded for distribution.

Dr. Kenyon exhibited a Rouch's portable stand, and Mr. Palmer one by Mr. Kennett.

A hearty vote of thanks was passed to Mr. T. Clarke, the late President, and a wish expressed that his health would soon enable him to take part in their meetings.

The meeting was shortly afterwards adjourned to Feb. 26th.

Berlin Association for the Promotion of Photography.

At the meeting of this Association on the 7th November, 1879, Professor Vogel in the chair, there was exhibited a very interesting collection of photographs taken in Nepaul, that still independent and little known country at the foot of the Himalayas. This collection was sent to the Association by one of the members, Herr Schinmer, principal operator of the firm of Bourne and Shephard, at Calcutta, and was received with every mark of lively satisfaction and approval. It contained portraits of inhabitants of Nepaul, and examples of the architecture peculiar to the country, which seems to be a combination of the Indian and Chinese styles.

A paper was read by Dr. Lagrange on a method of determining whether the bath contains a sufficient amount of silver for working purposes; as, for example, when it is desired to know whether the bath has not been reduced below its proper strength. For this purpose the author proposes to take a measured quantity of silver solution, and to mix it with a known quantity of a standard (1 : 10) solution of common salt; the mixture is then filtered, and the clear filtrate again mixed with a small quantity of the salt solution. If a cloud appears, the bath possesses the required strength. On the supposition that the experiment is always made with 1 cub. centim. of silver solution, the author has drawn up the following table:—

Silver Solution.		Solution of Common Salt.
1 c.c. of 1 : 4	requires	14·0 c.c.
„ 1 : 5	„	11·3 „
„ 1 : 6	„	9·5 „
„ 1 : 7	„	8·1 „
„ 1 : 8	„	7·1 „
„ 1 : 9	„	6·3 „
„ 1 : 10	„	5·7 „
„ 1 : 11	„	5·2 „
„ 1 : 12	„	4·8 „
„ 1 : 13	„	4·4 „
„ 1 : 14	„	4·1 „
„ 1 : 15	„	3·8 „

As an example of the way to use this table, suppose it is required to know whether a bath that has been for some time in use has been reduced below the strength of 1 : 10; take 1 cub. cent. of the bath in a test glass, add about 20 grammes of distilled water, and a few drops of pure nitric acid, and then 5·7 cub. cent. of the solution of common salt. Shake the mixture well, and filter into another clean glass; then add once more a little of the same solution of salt. If now a white precipitate or cloudiness is formed, the bath is stronger than 1 : 10; if the solution remains clear, then the bath is weaker. Should it be required to know whether a bath is stronger or weaker than 1 : 12, we have to add 4·8 cub. cent. of the salt solution.

The question was raised as to how much more sensitive an ordinary wet photographic plate is than a sheet of albumenised and silvered paper. Different opinions were expressed, varying from 1,000 to 500,000 times as sensitive. Dr. Vogel had deduced, as the result of his experiments with the magnesium light, a rate of 1 : 2,500, but Herr Hartmann pointed out that Muybridge's instantaneous photographs are said to have been taken with an exposure of $\frac{1}{10,000}$th of a second, which would give a sensitiveness 500,000 times as great as that of albumenised paper. Dr. Vogel, however, attributed this result to the concentration of light through a portrait lens, so that the proper comparison had not been instituted.

Professor Vogel also made some remarks on his later experiments with gelatine emulsion. He had tried the addition of ammonia according to the recommendation of Van Monckhoven, and had found that the emulsification was promoted and the sensitiveness doubled by that means. Eder had tried the same method with collodion emulsion, but had not observed any increase of sensitiveness. He had not, however, given up the hope of finding the means of endowing collodion emulsion with the good properties of gelatine, which, of course, would be an immense advantage. The speaker further stated that he had never found an intensifier to be necessary with gelatine emulsion; when trying it by way of experiment, he always met with difficulties; even in the case of the highly recommended mercurial intensification he had observed it to be sucked up by the gelatine, and to be held so fast that it could not be removed by washing, so that the action was still kept up. He added that in Germany, amateurs alone had recourse to the emulsion process, professional photographers hardly ever.

Herr Prumm doubted whether so good portraits could be obtained with emulsion as with wet plates. He was anxious to see a collection of photographs (not selected) taken by an English photographer who was in the habit of working with gelatine only.

At the next meeting, on the 21st Nov., the chief topic of discussion was the impurity of commercial nitrate of silver, a subject which has been previously much debated in the recent meetings of the Association. On the present occasion it was raised by the reading of a letter from one of the correspondents of the Association, who complained that he had found it impossible to obtain satisfactory results with the nitrate of silver which he had lately received from the dealers. He had had the salt analyzed by a chemical friend, and was assured that it contained considerable quantities of alumina and chalk.

The Chairman (Dr. Vogel), to whom a sample of the silver nitrate complained of had been sent, stated that he had submitted it to spectroscopic analysis, and was unable to discover a trace of either alumina or lime in it. On other grounds he held that the former substance could scarcely exist as an impurity of silver nitrate, as in fusing that substance the nitrate of aluminium would be decomposed, and the alumina alone would be eliminated. As regards the chalk, its presence would have no injurious effect on the silver bath, seeing that it was the constant practice to acidulate the latter with carbonate of lime. Dr. Vogel also explained that he had made a bath with a portion of the silver in question, and had obtained faultless plates with it.

Several of the members present thought the cause of the failure should be sought in the water, rather than in the silver, and Herr Quidde believed that a low temperature might have something to do with the defects described by the correspondent.

Dr. Vogel added that many operators often attributed their want of success to the nitrate of silver, when in reality it was due to traces of impurity allowed to remain in, or fall into, the bath.

Herr Kuntze showed a plate on which numerous small spots appeared; this he attributed to a too acid bath.

Mr. Wight remarked that these pinholes were often due to the presence of sulphuric acid; in England they were in the habit of curing the defect by the addition of barium nitrate to the bath.

Herr Schaarwachter had also tried barium nitrate, and could recommend it as giving brilliant pictures.

The President observed that according to his own experience the addition of barium nitrate to the silver bath gave a more vigorous image, but at the same time rendered it harder.

At the meeting of the 5th of December, the Chairman (Dr. Vogel) again brought forward the silver bath question. Herr Kuntze had sent him a specimen of the bath of which he complained at the previous meeting, as well as a sample of his collodion. The speaker had found the bath to work perfectly with his own collodion, and with Herr Kuntze's collodion the defects of which the latter complained only made their appearance after long use. Probably, therefore, the cause of the evil would be found to lie in the collodion, not in the bath. It appeared that Herr Kuntze had been in the habit of using a mixture of two commercial collodions. A decided opinion was expressed against this practice, as with a low temperature, insoluble salts of iodine and bromine were liable to separate, and to produce defects in the plate.

Herr Dauthendey, of Wurzburg, presented to the Association a collection of micro-photographs, magnified images of sections of minerals which he had prepared for the illustration of a work on mineralogy. They had been taken with a Hartnack microscope, by means of transmitted light, a condenser being used in addition to the ordinary concave mirror. The weather being bad at the time of operation, an exposure of from forty to seventy minutes was necessary, and the plates were kept from drying by pouring over them a mixture containing some glycerine—water 100 parts, glycerine 100 parts, and nitrate of silver 10 parts—they having been previously silvered in an ordinary bath. The prints were received with general interest, and were much admired.

Dr. Vogel took occasion to describe his own method of taking micro-photographs. He uses an ordinary vertical microscope, and places on the top of it a small camera without an objective, resting on a tripod stand. The eyepiece of the microscope is inserted in the camera, and is coupled to it by a cloth which prevents any light from penetrating. In this arrangement the plane of the ground glass slide is perpendicular to the axis of the instrument. With the help of the fine adjustment the image of the object is seen quite sharp on the focussing glass.

Talk in the Studio.

Photographic Society of Great Britain.—The Annual Meeting of this Society will take place on Tuesday next, Feb. 10, at the Gallery, 5a, Pall Mall East, when the officers will be elected, and the usual business transacted; after which a communication by Dr. W. Huggins, F.R.S., on "Photographs of Stellar Spectra," will be made.

Photographic Society of Ireland.—The next monthly meeting will be held at the Royal College of Science, on Friday, 13th Feb., at 8 p.m.

The Reproduction of Statuary.—MM. F. de Marnyhac and G. Hubmann yesterday received at their establishment, 163 and 165, Regent Street, a large number of gentlemen interested in fine art, whom they had invited to be present at the inauguration of the atelier they have formed there for the reproduction, enlargement, and reduction of celebrated sculptures, more especially those in the British Museum. The original work to be copied, enlarged, or reduced, as the case may be, is mounted on a stand which traverses in a horizontal slot, like the chuck of a lathe. The mass of plaster intended for the copy is similarly mounted upon another stand. Each stand is made fast by a screw beneath, but can rotate about a vertical axis, and the two are connected together by a chain which passes round them, so that the two rotate through equal angles in equal times, and are always in the same positions. The copying, enlarging, or reducing instrument employed is the pantagraph. It is pivoted to the bed of the machine, and is so jointed and suspended that the operator can make it work in any required plane. The guiding and the tracing points being adjusted to the proportions of the original and the copy, the operator has only to pass the guiding point over a portion of the original to make the tracing-point travel in precisely the same curve on the new scale over the corresponding part of the copy. The superfluous plaster is in this way removed from the originally shapeless mass, and the copy gradually assumes the life and beauty of the original. The whole work is done by the constant repetition of this operation—that is, the operator brings out every portion of the surface of the original in all its roundness, continuity, and smoothness, without its requiring any subsequent retouching.

To Correspondents.

Milo.—Any camera by a recognised maker would suit you. You would find the advantage of a swing-back directly you began work; it is for humouring the foreground of a picture or the top of it. Most photographers prefer to have their landscape cameras so fitted.

Wanderer.—Thanks for your communication; and we will note your remarks on copyright. The case you mention scarcely requires comment; it is a bad form of "sharp practice." We were glad to receive specimens of your work, in which there is much to admire.

C. N.—We know of no chemical means of a trustworthy character, but there is a very simple mechanical one: place the print upon a sheet of glass, and then draw it gradually over the angle of a glass-cutter or sharp paper-knife or folder. The back of the print once drawn or scraped against an angle in this way will never curl again.

W. F. M.—Any commercial gelatine dry plates should answer in British Burmah. Of course care in packing must be used to prevent access of damp. The employment of gelatine emulsion we should not recommend until we gain further experience, for gelatine will not set with the thermometer 90° in the shade. There would be no difficulty about developing gelatine plates, so long as the solutions were kept tolerably cool.

E. Wright.—Thanks for your cutting. In discussing the history of photography, and assigning the honour of being the first photographer, it is necessary first of all to make up one's mind what is a photograph. Do we mean a simple staining or printing effect like that produced upon a chloride of silver surface, or do we mean by a photograph an image in the camera caught and held fast for ever?

A. Q. M.—The only thing to be done is to use marine glue. Dry your bath well, and rub it well into crevices.

W. Barrington.—The process has been ofttimes described in these columns and in our Year-Books. Year-Book for 1872, and later, give details.

S. A.—It is a hypochlorite solution and well-known bleaching agent.

Inc. Swiss.—We should think it would be hardly worth while trying to recover silver bromide from your waste gelatinous solution. We recommend you to collect deposit and burn it to destroy the gelatine, and then to employ a sulphide or any of the well-known reducing processes to recover the silver.

Jacob.—Not at all: why should you? Simply fix in hyposulphite, and wash well. If you are tied for time, wash alternately in warm and cold water, by which means you will get rid of the hypo sooner.

T. P. Taylor.—You ought to do very good work with an east light; that of Messrs. Elliot and Fry, described in last week's News, is easterly. A double top-light might be useful, especially as you have a dead wall on the one side; indeed, we would incline to advise you to have it, only of course you will make proper arrangements to shut it off when necessary. It might, in some cases, help to give your model increased relief.

J. L.—1. The picture is bright and technically good, but you have the light falling all from one direction. Hence the absence of modelling in your picture. 2. Any of the rapid rectilinear lenses. 3. Try Morley's, at Islington; he might have what you want. 4. We cannot do so in this column.

J. T. T.—You could not have looked; it was the very first answer in the column. The Germans have a very trite proverb, "You can't see the forest because of the trees."

Gelatino-Bromide.—You ask us to decide a very delicate point, and we hope you will not take our advice till it has been confirmed; but if you want an answer, we should say No. 1 specified on your list.

Fred. Warner.—If the prints are from "wet" negatives, then these are over-exposed; hence the flatness. The prints were clean, showing good technical work, but the models might have been better lighted so as to give more relief. Too much light appears to come from one direction. We are afraid, after this frank opinion, that you will hardly be pleased.

Tyro.—Marine glue may be used as you buy it, but they sell also a solution for thinning it down. You may warm like ordinary glue, but, as it is very inflammable, the best way is to put the utensil containing it into hot water.

Leo.—We have only one opinion as to the stains, and that is, they are the result of a chance splash of some liquid on the negative. You surely have observed no such markings on other gelatine negatives; if you have, send us a few more prints. Apply to Mr. Werge, 11a, Berners Street, Oxford Street; he should be able to advise you about instruction.

Printer.—You can purchase the tissue ready sensitized of the Autotype Company, if nowhere else. See our advertising columns.

Rembrandt. Drawback. Emulsion.—In our next.

Several correspondents in our next.

The Photographic News, February 13, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Squaring a Circle—Photography and Wood-Cutting—English and German Pyrogallic Acid—Mechanically Printed Photographs of Jupiter.

Squaring a Circle.—Again there is a periodicity in discovery, a regular cycle, probably dependent on sunspots. Our friend —— (we won't gibbet him) has written to inform us of the wonderful power of a lens with a square-shaped aperture and rectangular stop. "Much better definition in the picture," he tell us, and "much greater rapidity of exposure—and why has it not been thought of before?" Both his lens and himself, unfortunately, have aberration, the one spherical and the other mental. We nearly began writing a treatise "on the use of a circular diaphragm for a lens," for our friend's benefit, but we refrained, as it might not pay; however, a few leading principles might be laid down without encroaching too much on our time. We recollect a similar hallucination as to the value of a square lens and square stops which occurred in the brain of a photographer at an early period in the history of the art. A prize was offered by the Society of Arts for the most portable and complete camera that could be designed. The prize was awarded for a five by seven camera consisting of endless pieces, together with these very remarkable adjuncts above quoted. Surely the Society of Arts should have known better! Our friend uses triangular diaphragms to give greater exposure to the foreground than to the sky of his pictures, and he says it is a marvellous success. Perhaps it is in his case, but with the ordinary optical instruments used by photographers the principle is quite inadmissible. If it be recollected, when a very small stop is used, that the margins of the pictures are altogether formed by rays coming through the margin of the lens, it will be readily seen that the only true method of giving different exposures to the sky and the foreground is by using a stop which slopes from the top of the lens mount towards the plate. For some landscapes this dodge is worth trying, and answers well; at the same time, it must be understood that the definition is not improved in the least thereby.

Photography and Wood-cutting.—Amongst the many applications of photography to the arts, there is none that has so silently—and, we may say, systematically—made a way in the trade as that of aiding the wood-engraver in his work. In at least one of the scientific periodicals of the day we know that many of the most complicated diagrams have been printed by photography on the block itself, and thus eliminated all chance of error arising from the imperfections of the draughtsman's copy. The favourite method, apparently, now is to cover the surface of the block with very fine enamel rendered sensitive to light, and then to print from a reversed negative on to the wood itself. The great fault in this process is the necessity of using water in the operation of fixing and washing, since the wood becomes thereby more than liable to swell. Another plan is to produce a transfer, as if for photo-lithography, in the ordinary manner, and to transfer it to the block instead of to the lithographic stone. There are many other methods extant, some of which are secret processes to the uninitiated, but very palpable to those who are accustomed to photographic printing of almost any description. The real desideratum is a method of producing printing blocks which can be set up with type, and though Gillotage has been successfully worked for many years, the objection by printers to a zinc block has, in a great measure, prevented its general adoption. No process can be considered perfect which gives a liability for the fine lines to disappear by "under-cutting," and in nearly every instance in which a block is produced this defect can be readily seen. There is a raggedness about the lines which is never seen in a wood-cut, and which mars the effect, even when very carefully worked by hand at the press. When it is remembered that the majority of periodicals are worked off by nearly automaton machines, it can readily be understood that a block must be as perfect as possible to prevent clogging, which almost certainly ensues if the raised ridges which print as lines on the paper are not very clearly defined at their apexes. We recollect, some time ago, that Mr. Warnerke produced some blocks which were remarkable for the sharpness of the impressions produced from them, and if anyone could ensure similar results in a harder metal than zinc the production of blocks from original drawings would be far more successful than it is at present.

English and German Pyrogallic Acid.—We are quite willing to take Dr. Vogel's word for the genuineness of the pyrogallic acid produced by a well-known firm such as Schering, of Berlin, and that the reduction of bromide of silver is more largely effected by it than by that of English manufacture; but if the Doctor examined some specimens sold as German pyrogallic acid, he would arrive at a different opinion. To begin with, the smells of the two kinds of acids are as different to one another as the smells of a German and an English town, which is usually pretty considerable. Then its behaviour with ammonia is very different, the discolouration being much more marked and rapid with the foreign than with the home brands. The difference in price also tells a tale which must not be overlooked. No doubt the best English and the best German pyrogallic acids are identically the same compound: why should they be otherwise? After all, it may be that all inferior brands, whether home-made or imported, are dubbed with the name of "German," and if so the Fatherland has a certain cause of complaint, but which, perhaps, it would be wiser on the whole to ignore, since the undisputed reputation of Germany for able chemists cannot be materially affected by it.

Mechanically-printed Photographs of Jupiter.—In the "Observatory" for this month we have two excellent mechanically-printed photographs of Jupiter taken with a three-foot silver-on-glass reflector by Mr. Common. The diameter of the planet as represented is about a quarter of an inch, the original negatives having been enlarged to 4 and 5¼ times. The editor remarks that, "small as the photographs are, they give much valuable information; and they have this great merit, as compared with the drawings of most observers, that they can be relied upon as accurate." He then goes on to invite a comparison of the photograph with a drawing made by a well-known, if not distinguished, Fellow of the Astronomical Society, which appeared in the last monthly notices of that learned Society, much to the disadvantage, and rightly so, of the latter. There is a certain red spot which has appeared of late on the surface of Jupiter, and it is this that is exercising our astronomers at present, making them photograph and draw our belted friend on every possible—and, perhaps, impossible—occasion. What with the red spots on Jupiter, a supposed new mark in the surface of the moon, and the largely increasing groups of spots on the sun, there seems to be an eruptive epidemic commencing in the solar system. It is satisfactory to know, however, that photography prevents the imagination of observers from running riot, and telling us of things which "are not." No one can turn over the leaves of the Astronomical Society's publications, which were issued before photography was employed for mapping the heavenly bodies, without feeling that there must have been a glorious uncertainty as to certain phenomena which the various drawings have been supposed to exhibit. Again, in solar eclipses the sketches of the observers and the photographs have always shown a decided variation one from the other, and however the discrepancies have been accounted for, it is probable that in future discussions of the results, more weight will be attached to the latter than to the former.

At Home.

THE LONDON STEREOSCOPIC COMPANY AT REGENT STREET.

"Pity the Alderman doesn't give us minnows," said our neighbour, as he sipped his turtle soup. To tell the truth, this was the first time we had tasted turtle, at Alderman Nottage's inaugural dinner, some five years ago, and we were a little uncertain as to its proper accompaniments. But we were not going to display our ignorance to a city man, so we promptly replied that it was a pity, indeed. "It finishes off a dinner so well," he said. "Puts the head on to it, in fact," was our jaunty auswer. Now, iced punch we knew to be an inseparable of turtle soup, and if it was the fashion, we argued, to drink punch, sweet and strong, immediately before partaking of turbot and hock, what was there out of the way in having minnows? They might be served up like whitebait, and sprinkled, possibly, into "thick" turtle; and we remember well that when this thought occurred to us, we immediately asked for some thick soup to follow the clear. "Oh! here they are," said our neighbour, as he passed his serviette contentedly over his beard; "I thought the Alderman would not have forgotten them." But they were not minnows at all; it was our own stupid mistake; it was about *menus* our neighbour was talking.

Since then we have had the pleasure of sipping turtle once more at a photo-aldermanic banquet, on the occasion of Mr. Mayall's mayoralty at Brighton. But this is not the point. We thank both gentlemen warmly for permitting us to share their honours, but we simply allude to the circumstance here to call to mind what very solid substance may be made out of mere shadows, particularly when transferred to albumenized paper. When we commenced this series of "At Homes," one of our first wishes was to pay a visit to a photographic establishment which had an alderman of the city of London at its head; and, curiously enough, now that visit has been paid, it has left little sense of novelty behind—and for this reason: we knew for certain, almost, that to have been so successful commercially in so many branches of photography, considerable business tact and marked enterprise must necessarily be at hand; and evidence of these were very apparent in every phase of the establishment at Regent Street. If a photographer could learn nothing else by a visit to the Stereoscopic Company's premises, he will, at any rate, get some idea how a successful business is carried on. A peep into the publication department is enough to show how keenly alive to the value of photography and its capabilities is the directing spirit of these large establishments. At Regent Street, Mr. Cox has the management of the publishing department, and the multitudiuous portraits with which he has to deal would be enough to bewilder any but a clear-headed man of business. Take the House of Commons alone; the gallery of politicians published by the Stereoscopic Company is of a very complete character, and the style adopted for the most part—the heads as large as a carte could well take them—is both a sensible and attractive one. We need not go through the long lists of portraits, but the Company appear to be peculiarly alive to forestalling the public taste, and having once made a venture, take care that they have a sufficient number of copies in hand to flood the market at once. They are keen in guessing at those likely to become popular favorites, and have confidence enough in their own judgment to follow up the idea by a large production of prints, which practically give them a monopoly. Those among our readers who have the good fortune to secure a likely model will do well to remember this. It is a point of business, we know, and not photography, but it is none the less worth noting.

We will pass over the subject of Zulus—for, strange to say, among the vast collections of celebrities we inspected there was not a dusky portrait to be seen—and proceed without delay upstairs. There are two studios for portraiture, one of them a very fine one with lighting due north. Mr. Harrison, who has this department under his superintendence, was good enough to accompany us. The principal studio is approached by a gallery of blue glass which has a most quaint and pleasing effect, not without considerable influence of a favourable nature upon the inteuding sitter. The same complaint as to the difficulty of getting suitable backgrounds, which was made to us at the establishment of Messrs. Elliott and Fry, is here repeated, and according to Mr. Harrison, there were no backgrounds equal to those of Seavey of New York. We express no opinion, but only note the remark.

"During a sitting the eyes may be winked," is the practical tenor of a little notice posted where the sitter may see it, while further to ease his or her mind, objects of various kinds are at hand to invite attention. As the studio is a roomy one, it is possible to place in it a wooden enclosure under which the cameras are placed. This wooden covering answers the same purpose as the canopy of drapery at Messrs. Elliott and Fry's; the latter has the advantage that it can be shortened or lengthened at will, but as there is plenty of room at Regent Street, a fixture answers the purpose as well.

The most important detail in the studio is the means taken to employ the electric light for portraiture. Anything more simple it is difficult to conceive, and we heartily congratulate Mr. Harrison on the clever and facile way in which he has been able to adapt the light to his wants. An album full of electric portraits shows plainly that only in a few minor points are they second to those taken by ordinary light, and there is not a sign about them to show they have not been secured by aid of the sun. If but a vignette is taken (say cabinet size) it is impossible almost to detect the difference, and only when a full-length is attempted, does a lack of detail in the extreme corners indicate signs of weakness. The exposure necessary is ten seconds for a carte portrait, and twenty for a cabinet.

We can explain the whole arrangement in a few words. There is a large camera-stand on castors. This carries a huge reflector about three feet in diameter, in the focus of which is the electric light. The stand and reflector are movable, for the electric wires that lead up are kept slack. You do not see into this reflector, for its face is covered with tracing cloth of the ordinary kind. The walls of the reflector are covered with enamel paper, and thus the light is reflected through the tracing cloth. Probably, the reflector, with its paper lining and facing of cloth, did not cost twenty shillings to construct. We sat down, and Mr. Harrison, pressing a switch, turned the light upon us. The illumination was bright, of course, but of a very mild nature, and gave rise to no unpleasant feeling; and when a sort of gauze screen was further interposed to soften the glare, the effect was really pleasant. A movable three-sided screen of white paper to partially shut in the sitter was employed to light up the dark side of the model, and the arrangement was complete. As, however, the light, if fixed, is apt to give shadows of rather too defined a character, it is desirable that the reflector should be moved during exposure, and this is done by the photographer turning the instrument a little to the right or left, an operation easy of performance, since the electric light is pivoted upon a ball-and-socket joint. The distance of the light from the sitter is some eight or ten feet, but as the stand that carries it is perfectly mobile, it may be moved about as easily as the camera itself.

To those interested in the matter, we may say that the light employed is a Siemens, and has an illuminating power equal to 6,000 candles. It is very probable that forty or fifty per cent. of this is stopped by the tracing cloth and gauze screens, but these are, of course, necessary for purposes of diffusion, and are, we think, a most simple and

happy means of softening down the terrible intensity of the light. An engine of eight-horse power is employed; but this supplies enough energy for a second light, and would probably suffice for a third if it was wanted.

The Company store their negatives at Kingsland, where the printing establishment is; they are kept packed in paper, and not loose in racks. Carbon printing is employed, but only for enlargements, and, as our readers might expect, several artists of talent are included in the staff of the establishment, both for the purpose of touching and colouring. The new form of portrait which is usually termed the "promenade," but which here goes by the name of "boudoir," is an accepted *format*.

The "At Home" next week will be "At the Autotype Works, Ealing Dene."

ON A NEW ACTINOMETER.

BY LEON WARNERKE.*

The phosphorescent substance that I prefer at present is calcium sulphide. Strontium is easier to prepare, but it is more affected by temperature, and when exposed to light at varying temperatures, it emits different colours, and also different intensities of light; in general, the higher the temperature, the lower the intensity. Zinc sulphide, apparently, should be very useful, not being affected by moisture, but its preparation is most difficult.

There are several systems recommended for the preparation of phosphorescent calcium sulphide. The result depends on the choice of a natural carbonate. M. E. Becquerel prefers the following method:—Fibrous arraugonite is first transformed into lime, and then treated with nitric acid; from this solution carbonate is again precipitated with ammonium carbonate; this is well washed, mixed with 48 per cent. of sulphur, and in a well luted crucible submitted during twenty-five to thirty minutes to the heat of charcoal at the temperature of 800° to 900°. If coke be used, the time of baking is less. When the temperature is too high, or the action too long, all trace of phosphorescence disappears. The colour and intensity of the light emitted depend on this preparation. With nitric acid the colour of the light is generally blue or green; if hydrochloric acid be substituted, the colour is generally yellow or violet.

It has been observed that the intensity of light depends on temperature during the preparation, but that the colour depends on the molecular condition of the primitive mineral.

There is another easy method of preparing yellow phosphorescent calcium: cuttle-fish bones are first heated with half their weight of sulphur for half an hour to a red heat, the obtained product is then mixed with two per cent. of peroxide of manganese, and again heated for twenty minutes to a red heat.

A question will be naturally put as to whether the sensitiveness of the phosphorescent mineral has the same limits of refrangibility in the spectrum as the silver salts? In answer to this question I put before the meeting sixteen various data, published by M. E. Becquerel, from which it will be seen that these limits vary very much with different samples; and consequently, by choosing this or the other sample, as near an approach can be made as desired for any special case. It must, however, be observed, that generally the maximum of sensitiveness is nearest to the violet end of the spectrum. In the sample I used for the manufacture of the apparatus before you, according to the rough determination made with Captain Abney's photo-spectroscope (the sun being absent), the exciting action begins about the line F.

Another very important question is this: Is the light emitted steady enough in the limit of time necessary for the observation? In answer, I copy observations made by M. E. Becquerel on a sample of blue calcium sulphide. The intensity of emitted light was determined by a system especially adapted to this case:—

Time.	Intensity.	Time.	Intensity.
0″	1·	545	0·006280
35	0·076300	700	0·004582
75	0·034883	930	0·003084
125	0·026752	1110	0·002586
170	0·017899	1305	0·001996
265	0·011744	1525	0·001736
420	0·007765	1725	0·001488

It is evident from these observations that during the first 30″ after exposure, the light rapidly diminishes, and that subsequently the diminution is much slower.

According to the same authority, the difference of one-fiftieth of intensity is easily observed by the retina. Taking a lesson from this table, it is desirable to begin observation about 30″ to one minute after insolation. As regards the time necessary to excite luminosity, owing to the coarse nature of the phosphorescent powder, I found that the full amount of excitement was obtained in about three seconds, and not instantaneously, as should be the case if the surface were polished. When an observation is to be made in bright daylight, it is advisable to cover the head with dark cloth, and to keep the eyes closed for a short time before the reading is taken.

The scale, J, can be made with films of gelatine or of collodion suitably coloured; the opacity is produced by the superposition of several thicknesses. The numbers are so arranged that No. 2 indicates double the intensity of No. 1, &c.

Lastly, I must mention that this actinometer is very delicate—indeed, it perfectly registers the actinic powers of ordinary candle, gas, or indeed of any other light possessing actinic power, no matter in what small proportion—a feat that could not be performed by any photometers recently described by myself, nothwithstanding that they all act cumulatively. The extinguishing medium, L, apparently, should be of a red colour. In the model before you it is green, as of all the red colouring matter I have recently tried, none extinguishes so satisfactorily as this green.

* Continued from page 64.

DR. MONCKHOVEN ON PLATINUM PRINTS.

Dr. van Monckhoven, in a letter addressed to the *Bulletin de l'Association Belge de Photographie*, says:—

"At the first introduction of photography it was imagined that silver prints must be permanent, because the metal silver is not at all, or at all events very little, affected by the action of the atmosphere. When, however, it was observed how soon prints in chloride of silver are liable to fade and change, the plan was adopted of transforming the silver image into one of gold, or even of platinum—for the use of platinum in photography is a very old one.

"Notwithstanding these precautions, however, the prints, whether in silver, gold, or platinum, were found to change the same as before. This change was then attributed to imperfect washing; it was supposed that a trace of hyposulphite was left behind, and that the sulphur of this compound attacked the metal forming the image, and decomposed it. Acting on this supposition, some photographers resorted to long-continued washing, while others dispensed altogether with the use of hyposulphite for fixing, and substituted for it the sulphocyanides, or even the alkaline cyanides. Vain precautions! The prints were subject to fading as much as ever.

"This points to the fact that the notion of imperfectly washed-out hyposulphite being the cause of the mischief is merely a prejudice, and here are still stronger proofs of its being so. Negatives fixed by hyposulphite of soda do

not change; so also the albumen positives on glass produced by Ferrier in 1852 have shown no signs of alteration.

"But it may be objected that these are only developed prints; it will be asked, Can you show us prints produced directly by light blackening the chloride silver, which have undergone no change? To this objection I have a complete answer. In 1867 and 1868, Obernetter, of Munich (the same who has effected such important improvements in the process of printing with fatty inks) conceived the idea of substituting for the albumen of our paper positives an emulsion of collodio-chloride of silver. During those years several thousands of prints were produced by this process, and though they were all fixed by hyposulphite of soda, not one of them has suffered in the slightest degree from fading; they are as good and fresh now as the day when they left the studio. As regards this process I am convinced that the prints by the collodio-chloride process owe their permanence to the method of toning adopted—that is to say, the sulphocyanide of gold.*

"I send you with this letter two prints published in 1868 by the *Photographische Mittheilungen* of Berlin, and by the *Photographische Correspondenz* of Vienna. I ask you to examine them closely, and to tell me whether they are not as fresh and bright as prints taken only yesterday. My own opinion is that the incurable cause of fading in silver prints is due to the albumen or other analogous colloids contained in the paper.

Referring, now, to another subject, I want to prove to you that the direct production of prints by means of gold or platinum without the intervention of hyposulphite is by no means a new process. Several years ago, though not so long but what many of us can recollect the fact, Niépce de St. Victor suggested a method of coating a sheet of paper with nitrate of uranium; when this is exposed to light beneath a negative the uranic salt is reduced to the uranium salt in the parts acted on by the luminous rays. Plunging it now into a solution of chloride of gold, or of platinum, the image is developed, and is entirely composed of gold or of platinum. A simple washing is sufficient to fix it.

"Moreover, the process with ferrous oxalate and the salts of gold and platinum was described by me in the *Bulletin Belge de la Photographie* as long ago as the year 1863. My process was to prepare the paper with iron oxalate and ammonia, and when they were dry to expose them. The development I effected solely by dipping the paper into a solution of chloride of gold, and subsequent washing in water. I used no hyposulphite of soda whatever. I was able to produce these prints in either gold, silver, platinum, or palladium, and they had exactly the same appearance as those now taken by Mr. Willis. As you will see, therefore, my process, except as regards the details of manipulations, was precisely the same as that lately invented.

"Now comes the point: these prints of mine were found to fade and change, just as the others did. And why? Because, in a state of subdivision, the metal, whether it be silver, gold, or platinum, succumbs with great readiness to the effects of atmospheric agency, more especially of such elements as sulphur and chlorine. The atmosphere contains sulphur in the form of sulphuretted hydrogen, and chlorine in the form of sodium chloride, and both gold and platinum are metals which are readily attacked by sulphur and chlorine. Many of us imagine that platinum is pre-eminently a metal which does not easily combine with other substances. This is an error. Platinum in a state of subdivision is not more permanent than gold; it is attacked by chlorine without heating, and every one knows that the gold of our prints fades in the course of a few years.

* In my own method of toning, there is always a slight deposit of sulphur, in consequence of the gold bath reacting on the hyposulphite of soda, a part of the sulphur from which is precipitated on the image.

"For my own part, I have not waited for the platinum process to be demonstrated in my own country before making myself acquainted with it. I enclose in this letter my own portrait taken in platinum a year ago. Since then it has been in my laboratory, and I must say it has in a marked degree lost its original intense and velvety black colour. It is all very well for Mr. Willis to assert that the prints taken by his process are permanent. They are not more so than those taken with exactly the same method by Niépce de St. Victor, and by myself in 1863. His assertion, therefore, can only be confirmed when his pictures have stood the test of time.

"One word more to show you that I am not actuated by prejudice or partiality. I am perfectly willing to admit that Mr. Willis has introduced great improvements in the details of operation, and that he has much simplified the manipulations. Willis's process, as regards permanence of the prints, is much superior to the silver and albumen method, and it is an excellent one for amateurs to adopt; but it cannot, like carbon printing, or impression with fatty ink, or Woodburytype, be said to produce pictures whose permanence can be guaranteed. Carbon alone of all substances that we know is able absolutely to resist the action of time.

"Dr. Van Monckhoven."

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."

No. 3.—Lantergan the Organist.

It is over ten years ago since I made this negative; it is smaller, and consequently more primitive in appearance, than the last. I had just commenced work in a studio situated on the Lincolnshire coast, and was labouring hard to overcome the light when Mr. Lantergan came to sit for this negative. I deem it necessary to give you a little description of this same studio, as it has never been my ill-luck to work in one like it since. The proprietor was a stationer and bookseller, and knew as much about photography as an engine-driver might be supposed to know; still, that did not deter him from going heart and soul into a speculation that promised such rich returns as the art produced in provincial towns at that date. So Mr. Mogg cleared out the plants and berry bushes from his garden, and built his studio. I cannot tell where Mr. Mogg got the plan of that studio—to me it seemed an outcome of Hanwell or Colney Hatch.

It was built as the ground would admit—consequently it ran from N.E. to S.W. It was a spacious room and lofty. An arch divided one end from the other, and from each side of this arch rose four feet of glass, sloping outwards at a most acute angle. This was a front top light—"For lighting up the picture and softening the shadows, you know," as Mr. Mogg explained it to me.

Now when you consider that this small amount of skylight was placed over twelve feet above the sitter, you can judge of its utility. The side lights rose to about fourteen feet; each black support tall, cold, and as uninviting as a lamp-post. The side lights were decorated with huge black curtains, that sent a chill through you to look at. I don't know if you will properly understand this imperfect description, but, to aid you, I may say that I had always too much light or too little: on dull days I had to work in a cold twilight, and on bright days the glorious orb would glare upon me in the morning from one of the top lights in the most aggravating manner; towards noon it would attack my side light, when, chased away by the aid of the black curtain, it would stream in from the other top light; later on it would pervade the whole place, and cast reflections from unseen windows all around; finally, it would go off in the afternoon with a parting blaze in the dark room window enough to boil the bath.

Now you will understand how it came about that the present negative has a dense, over-exposed appearance. I remember the day as well as if it were only yesterday; we had not been opened above a couple of weeks, and our little show-room was but scantily furnished with specimens; indeed, I had robbed the album at home, so as to make a bit of a show. That same bright morning I was favoured by a visit from the parish doctor. He was a droll, fussy old fellow, with a snappish dictatorial way of speaking, probably acquired among his poor patients.

"Morning! morning!" he snapped. "How are you getting on, eh? Plenty business, eh? Ah! no reason to complain; very good—very good, indeed! Any of the people here that I know?" he added, as he adjusted a pair of spectacles and proceeded to examine the pictures on the table (the first picture that came to his hand was a vignette of myself). "Hum! a face I've seen somewhere—a bold-looking dog—knock you down as soon as look at you! Oh! oh!—oh! ho!" he next cried, as he picked up a picture of my mother, "there is no mistaking this old Jezebel—she used to keep the 'Fox,' and tried to poison her husband."

"My dear sir, I beg your pardon," I commenced.

"Yes, yes—I know her well. Who have we here?" he continued, picking up the cabinet portrait of a lady acquaintance who is rather given to obesity. "Here's a porpoise! Saw you ever such a figure? Upon my word, I'll have to come and grant you a sitting myself, for you seem to have picked up the most outlandish lot of sitters you could find in Lincolnshire."

There is not, perhaps, much in this anecdote; but it has its moral, viz.: Don't exhibit your relations' photographs in the room where you may be subject to such thoughtless remarks as those propounded by the doctor. Such fussy old fellows do not mean any harm; but their chatter is almost sure to hurt your feelings and your temper.

Thus it was that when Lantergan looked in that bright morning, and the little doctor departed, I was not in one of my happiest moods. Lantergan, the organist, was a little man with a large head, great rolling eyes, and a white face deeply indented with small-pox.

"I want you to make a very nice picture of me," he exclaimed, with a simper that I thought strange. "You must know that I want it for a particular purpose, and—and could you manage not to show these marks, eh?"

Now this was before retouching had dawned upon us with its magic power—when we had to do the best we could with our lighting and our chemicals to overcome the difficulties in our way arising from skin blemishes and the like. This happened in the days when a photographer used to point to the wrinkled forehead, or the dark-coloured mole in the prints, as a proof of the likeness and the sharpness of his work. I can remember thinking myself defrauded when any one asked me to hide the crows-feet or the wrinkles.

"You see I want to look my best," he continued, with his queer simper. "I just want my best, you know, and I want to look as young as possible."

It was now a tacitly understood thing with my sitters that they do not only *wish* to look young, but that they *must* have it so. But Heavens! Ten years ago things were different; and so odd did it appear to me that, while coating the plate, I resolved, if possible, to discover the reason why the little organist wished to look so youthful and blooming.

The light in which I photographed him was diffused, and I remember how his great white face loomed forth as I took a last critical glance previous to exposing.

It was a comical situation to see the solemn little man sitting there waiting for the word to light up. When I had everything ready, I gave the word. I gave a side-long glance at him and discovered that he had lit up considerably too much, his mouth being stretched out in an awful grin. This being rectified, I exposed a good long minute, and developed with an ordinary developer; washed, fixed, and then intensified with a strong solution of permanganate of potash.

This formula will make many laugh, but I assure you that was the way I made the organist look young, and obliterated the marks of the smallpox. By printing this negative in the sun I got the best results.

This was ten years ago; printing in the sun and intensifying by means of permanganate are only done in extreme cases; the latter I should advise never to be used in portraiture; but in copies, or to give a printing depth to outside work—interiors, &c.—the cautious operator will find it very valuable.

In three or four days, the organist called for his proof, and went away ordering a dozen copies.

From that day to this I have never seen him.

He disappeared from Lincolnshire, but he left a legacy of fun to the inhabitants—his name being a bye-word in the pot-house and kitchens to this day.

The following extract from the *Boston Chronicle* will explain his disappearance:—

"It seems that the good folks of L——, having become possessed with a wish to have the fine organ of St. James's touched on Sundays by a master-hand, engaged the services of a young Welshman, named Lantergan, and paid him a good salary for same services. Of his musical abilities no one can doubt, but his good taste in other matters of a more delicate nature is severely questioned by the good folks of L———.

"It seems that the maidens of this little market-place are accredited with having an extra share of charms—that, in short, they possess more beauty and loveliness than can be otherwise found in the Fens. Now if young Taffy wished to secure a partner for life, why could he not have searched for her amidst the local beauty, and not put such an affront upon them as actually to go and advertize for one in the Liverpool papers. But let the young beauties of L——— take grace of heart, for the young organist has been sorely punished for his cruelty and audacity. In his foolish advertisement he did not only want the lady of his choice to be possessed of great personal and intellectual charms, but she must be of independent means! Aye, there's the rub! The maidens of L——— are pretty, but their wealth of goods and chattels are *nil*.

"Now this advertisement of the Welshman attracted the notice of some rollicking blades who resolved to hoax the poor organist. Accordingly answer was made to the letter in a neat female hand, and in the course of two or three postal deliveries gushing letters were passed between them. The fair one next wished to see what kind of man she was making love to, and *vice versa* on Lothario's side. This resulted in an exchange of photographs. Lantergan dressed with extraordinary care, paid a visit to the artist at Mr. Moggs, and then obtained a picture of a flattering description; this he posted to his inamorata, and received in return the picture of a young lady, the ideal of grace and beauty. The organist was in raptures, and nothing now would satisfy but he must have an interview with a view to arranging for a speedy union.

"The upshot of all this folly was, that he was trapped into the centre of the hoaxers in an hotel in Liverpool, and only escaped the rough treatment meant to be bestowed upon him by his presence of mind. 'Gentlemen, he cried, raising his hand, 'I see it all! I have been hoaxed—What will you have to drink?'

"How the story reached L——— is at present a mystery, but that it did reach the good folks' ears there can be no mistake, and St. James's is once more without an organist."

To be continued.

The Photographic News.

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CONTENTS.

PLATINOTYPE.

Mr. Spiller's paper on the permanence of platinotype pictures, which appears in another column, must give confidence to those who have recently adopted this mode of printing. Mr. Spiller's tests have, it must be conceded by all, been most exhaustive and crucial, and have extended, he tells us, over a period of three months, while the ability of this veteran photo-chemist to conduct such an investigation is a point upon which no one will raise a question.

Nitric acid, sulphuric acid, and hydrochloric acid were all in turn tried upon the platinotype, and as regards the last the acid was employed in a concentrated form. But an hour's immersion in these acids was altogether without effect; nor did weak caustic soda, sulphurous acid, hyposulphite of soda, strong ammonia, or cyanide of potassium bring about any appreciable change. Hydrosulphide of ammonium, of all the tests applied by Mr. Spiller, was the only one that worked any alteration, which, he says, would be regarded by many as a change for the better.

We must come to the conclusion, then, that the platinotype is one of the most permanent of our photographic prints. Of course, we are ready to admit that permanency is not everything, and that, moreover, in the case of some negatives, the platinotype results cannot compare with silver prints from the same cliché. But platinotypes are, in most cases, very agreeable things to look at, and when we have a chemist of Mr. Spiller's standing coming forward to vouch for their virtual permanence under ordinary circumstances, we are sure there will be many photographers ready to give the process a trial. That the prints at present have defects it is idle to deny, a certain washiness and mealiness being sometimes very apparent; but what new process has not its shortcomings? On the other hand, however, the clear, engraving-like look of the impressions is an advantage which will cause the platinotype to be ofttimes preferred to the warmer silver print.

Dr. Van Monckhoven's remarks, to which Mr. Spiller has referred, will be found on another page.

REVERSED ACTION OF LIGHT.

We have had several letters recently on the subject of a positive image being developed on gelatine plates instead of the ordinary negative image, the cause being traced to over- and pre-exposure. It may be worth while to call the attention of our readers to this point, as it is one which requires the attention of experimentalists, and the defect would become an undoubted drawback to this process were it irremediable. In the early days of the collodion process, when bromo-iodized collodion was unknown, and when the photographer had to depend solely on iodide of silver as a sensitive salt, the same defect was frequently met with, and the image was said to be "solarized." What this term implied is rather doubtful, but at all events, the phenomenon was well marked, though its origin was not understood. Some two years ago Captain Abney brought the subject before the Photographic Society, and demonstrated that this reversed action was due to an oxidation of the exposed silver salt; that is to say, that when one action of light had terminated, another began its work. Firstly, the whole of the sensitive salt in the exposed portions of the film which received the bright parts of the image (such as the sky) was reduced to the sub-salt of silver; and secondly, when this reduction was completed on a particle of the silver salt, immediately it began to take up oxygen from its surroundings. This oxydized material seemed to be undevelopable, whilst the portion of the image less intensely lighted, developed out in the normal manner; and the parts of the picture that should be absolutely transparent became veiled—or, rather, developed with an intensity altogether abnormal. It may be well to draw the attention of photographers to the reason of this last phase, as it readily accounts for the veil which is formed in pictures in which the exposure has to be prolonged to bring out detail in deep shadows, such as in interiors of buildings, though the high lights usually are exceedingly brilliant, and would, under ordinary circumstances, require but a brief uncapping of the lens. When focussing such a picture, if the operator remove the ground glass of his camera, and place his eye one side of the camera, when the dark cloth is over his head, he will see that the lens itself is illuminated on a spot occupying the extremity of a line passing through the diaphragm and the bright object. The illumination is faint, but still the substance of the lens itself becomes a source of light, and the rays are not guided to form any image, but radiate in every direction.

If glass were perfectly transparent, of course this illumination could not arise; and where there is no very decided contrast the low brilliancy of the light radiating from the illuminated lens is of no account; but where the exposure has to be very prolonged, this secondary source of light has time to act, and veils the plate on development. As a rule, we have found that if an image be sufficiently intense to produce solarization, the secondary illumination is sufficient to produce a veil, and thus to give a positive picture.

With gelatine plates this reversed action of light is, perhaps, more likely to occur than with any other plates, since the gelatine itself is readily decomposed. It must not be forgotten, for instance, that when the bromide of silver is decomposed, bromine is liberated, which enters into combination with the gelatine. What the resulting compound is it is beyond our present limits to discuss; suffice it to say that it is more than probable that the gelatine is split up into new compounds, one of which is very likely to oxidize the reduced silver salt in contact with it, more particularly if the exposure is sufficiently prolonged. Similarly, when a gelatine plate has seen white light, and is subsequently exposed in the camera, oxidizing action may take place, and give rise to the baneful result indicated above, though the oxidizing compound and the silver salt might remain in close quarters with one another in the dark without any combination whatever arising between the two. How to get over this defect is perhaps a more difficult question to answer. In collodion films, which are easy to impregnate with readily oxidizable matter, and which has to be oxidized before the silver salt is oxidized, the remedy is apparent; but when using gelatine there is a certain amount of difficulty. It probably will be found that by adding pyrogallic acid to the liquid emulsion immediately before coating the plate something may be done to prevent this very troublesome reversed action.

On dry plates made with collodion, when most of the ordinary preservatives are used, the production of a positive instead of a negative was almost, if not quite, unknown, since most frequently they contained gallic acid, or pyrogallic acid, as in the gum-gallic process of Mr. R. M. Gordon, or the beer process of Canon Beechey. Should it turn out that this reversal in gelatine plates is, to a great extent, due to a surface action, the treatment indicated may be modified. To settle these points we have experiments on hand, with which we shall duly acquaint our readers.

Notes.

The King of Portugal is a member of the French Photographic Society.

The Deputy Director of the Ordnance Office, Calcutta, is still alluded to as "Captain" Waterhouse. Our gallant colleague, who belongs to the Bengal Staff corps, has, nevertheless, held the rank of Major for some months past.

Mr. Mayland, of Regent Street, advocates the employment of a lamp or candle provided with a coloured shade for the development of gelatine plates. Daylight does not ensure such constant illumination, and, moreover, it is sometimes treacherous.

Touching this subject, our readers may remember that Mr. Baden Pritchard has succeeded in securing an image upon a Swan gelatine plate, exposed in the camera for three minutes, behind a double thickness of ruby glass. A glass of ruby, combined with another of orange, was, however, according to the same authority, sufficient to stop the actinic rays.

We alluded last week to the employment of luminous or phosphorescent paint. One of the cabins on board the *Comus* corvette has been painted with the preparation, in the hope that the walls will absorb and emit light. The *Comus* is altogether an experimental vessel; she is the first of our new steel flotilla, which consists of nine corvettes and two despatch ships, all built of this metal.

The Minister of Public Instruction in France has granted Professor Graham Bell, the well-known telephone inventor, £2,000, a sum in his power to award periodically to scientific men, under the name of the Volta Prize.

Mr. Grant, the photographer attached to the Dutch Arctic expedition in the ship *Willem-Barentz*, has succeeded in bringing back sixty negatives of views of the north Polar region, notwithstanding the almost continuous fog, which rendered photographic operations extremely difficult. On land, Mr. Grant worked with wet collodion plates; at sea, with collodion emulsion.

The advisability of producing photographic copies of a despatch came under the notice of the House of Commons the other day. Mr. E. Stanhope, replying to a question by Sir H. Wolff, admitted that in a telegram sent to the late Ameer Shere Ali in 1869 Her Majesty was styled Empress of India. The telegram was first headed from "the Queen of England," but this was altered, apparently in the Duke of Argyll's handwriting, to "Queen of Great Britain and Ireland, and Empress of India." It was a Liberal Minister, therefore, who had employed the title of Empress, a circumstance at once capable of proof by the production of a facsimile of the original despatch, which is still in the archives of the War Office.

Dr. Eder, whose labours in connection with photographic development, &c., are well known, has consented to deliver a course of lectures on photography before the Vienna Society, provided the President will guarantee an attendance of not less than a dozen members. Our Society in London might note this with advantage.

It is announced from Paris that M. Liébert has received from the King of Portugal the Order of the Christ. Commenting on this announcement, the Editor of the *Bulletin de la Associatiom Belge de Photographie* observes that M. Liébert must now be the best decorated photographer in France. Certainly his case at the International Exhibition of 1878 was no less conspicuous for the insignia of the various orders that he possesses than for the photographs he exhibited.

In many parts of North Germany photographers have been much exercised by a police regulation forbidding them to open their show-cases on Sunday. This regulation appears to have been enforced by the police with some strictness, and has given rise to much complaint of the Sabbatarian views of the authorities. However, in Berlin and Cologne the complainants have succeeded in getting the rule abrogated, having convinced the magistrates that the cases do not contain objects for sale, but that they serve only the purpose of an advertisement or poster.

Many photographers, who are not blessed with warm and well-ventilated dark rooms, complain of the long time it takes them to dry their gelatine plates. In consequence of this inconvenience, they prefer buying the plates ready prepared. Professor Vogel recommends them, so soon as the emulsion has set, to dip the plates in absolute alcohol, and then to support them in a vertical position. Treated in this way they will dry, at a moderate temperature, in the course of a couple of hours.

Mr. Jabez Hughes, of Regina House, Ryde, is taking up the platinotype for his cabinet portraits. He sends us some unusually good prints.

Professor Abel, C.B., F.R.S., well known as a war chemist, and for his researches on gun-cotton, soluble and insoluble, has been elected President of the Institute of Chemistry for the present year.

Our amateur friends will do well to study Mr. H. P. Robinson's article on "Portraiture without a Studio," in last week's News; they may not soon again have the opportunity of hearing such good advice.

We were glad to hear the Treasurer's statement, on Tuesday evening, of the financial position of the Photographic Society. It seems that at last the Annual Exhibition in Pall Mall has been made to pay, while the accounts of the Society are in such a flourishing condition that there are funds in hand at this moment exceeding three hundred pounds.

Mr. J. R. Sawyer, of the Autotype Company, will shortly contribute to these columns an article upon the subject of "Carbons on Opal," the delicate pictures which have attracted so much attention of late.

Dr. Huggins, F.R.S., exhibited his spectra of the stars to the members of the Royal Institution on Friday last, and explained his mode of procedure. Mr. Rutherfurd, of New York, it may be remembered, adopted a very simple plan for securing a trustworthy map of the heavens with the camera, when he was engaged on similar work. His camera was treated like an equatorial telescope—that is to say, mounted on a moving structure, which kept pace with the earth's rate of travelling, and thus permitted the images of the stars to remain stationary upon the collodion film sufficiently long to impress it. But the star images were of so minute a character that they could not readily be distinguished from chance specks in the film, and, therefore, to make matters quite sure, he caused a double image to be impressed. The plate was exposed in the moving camera for a sufficient time to get an image, and its movement then arrested for the space of half a minute; at the end of that period (the earth had moved in the meantime) the camera was set in motion again, and the result was, when the plate came to be developed, double points to represent each star.

What has become of Rejlander's valuable collection of negatives? Such pictures as "Did She?" "The Dear Creature is Looking at Me," "At the Play," would make famous carbon enlargements, and certainly command a ready sale. By-the-bye, "Did She?" would be a capital title for a novel.

There was one picture—in his mind's eye—that Rejlander tried often, but unsuccessfully, to realize with his camera. One day—when he lived in the busy town of Wolverhampton—he had need of a pair of scissors to trim a print, and despatched a girl for them. She was a long time gone, and at last Rejlander, impatient of waiting, went out into the court that ran beside the house to look for her. It was a dark, grimy thoroughfare, surrounded by sooty chimneys and brick walls, but a bright ray of sunshine had somehow managed to stray into the place, and when the master looked out he saw his little messenger with the scissors in her hand, standing on tiptoe, endeavouring to snip the ray in two. Rejlander used to say that the production of a picture like this was out of the domain of photography.

Experimenting with iron oxalate in developing gelatine emulsion plates, Dr. J. Schnauss finds that ferrous lactate is an excellent developer in the ordinary wet collodion process. He recommends a solution of this salt on account of its developing rapidly and evenly, and because it brings out the half-tones with great softness and fine gradation. To prepare it the lactate of iron is dissolved to concentration in hot water, and then filtered; when cold, it is mixed with glacial acetic acid and alcohol in the usual proportions.

Topics of the Day.

THE PLATINOTYPE: ITS CHANCE OF PERMANENCE.

BY JOHN SPILLER, F.C.S.

A warm discussion is just now going on in Brussels, consequent upon a practical demonstration of Willis's Platinotype having been given at the December meeting of the *Association Belge* by M. Totherick, who showed the working of the process pretty much in the same manner as Mr. Willis himself explained to our London photographers a year previously, at one of the meetings of the Parent Society.

After describing the process, and developing several prints, M. Totherick went on to say that the platinotypes had been tested for permanence in a variety of ways. "They had been exposed to sunshine for several months in Italy without any change, and that the prints likewise resisted the action of chlorine, of sulphuretted hydrogen, and other acid bodies."

This statement was called in question by Dr. Van Monckhoven, who, unable himself to attend the meeting, addressed a letter to the Chairman, M. Géruzet, and the Doctor's letter is printed at length in the *Bulletin*, occupying four pages of very interesting matter. I need only here briefly state that the writer lays claim to the discovery of the principle of the platinotype, but throws doubt on the question of permanence, and asserts that a portrait of himself taken little more than a year ago, and hung up in his laboratory, has lost its velvet-black aspect, and has manifestly changed for the worse. The pernicious elements especially feared by Dr. Van Monckhoven are sulphur and chlorine arising from the presence of sulphuretted hydrogen and chlorine (as chloride of sodium) in the atmosphere, and, says the writer, "gold and platinum are metals very much changed (*fort altérables*) by sulphur and chlorine," and that, in point of fact, the platinum prints are not more permanent than those toned with gold.

Against this we have the definite statement put forward last month in the News by the Platinotype Company (page 59) to the effect that in their premises a print fastened to the wall of a room which is often filled with chlorine fumes shows no sign of alteration; that a platinum print is not even affected by immersion in a jar of chlorine gas, although not certainly able to withstand the attack of aqua regia, on account, it is supposed, of the peculiarly destructive action of *nascent chlorine*.

Such is a fair summary of the published evidence to-day on this all-important question of permanence, and I have now the honour of bringing to the notice of your readers the results which, during the last three months, I have obtained in a course of experiments directed to this self-same end—an enquiry instituted for the purpose of studying the conditions of permanence under a great number of varied chemical tests.

The prints, ten in number, were kindly supplied to me by Mr. Herbert B. Berkeley for the purpose of experiment, and I have much pleasure in acknowledging my indebtedness to that gentleman for the opportunity afforded of working upon normal specimens of the platinotype, and for materials and information given in regard to them. Some of the prints were cut into sections and separately treated, so that the portions could afterwards be patched together again for comparison, when any loss of vigour or alteration of tone would become at once apparent.

In this way I have tried the action of all the common acids, using these of such degrees of strength as seemed fair to the paper basis of the photographs. Thus, the nitric acid was diluted with an equal bulk of water, and sulphuric acid with three measures of water; but hydro-

chloric acid, having itself so little action upon paper, permitted of its being employed in the concentrated form. After an hour's immersion not one of these acids exerted the slightest action upon the platinum prints, nor did weak caustic soda, sulphurous acid, hyposulphite of soda, strong ammonia, or cyanide of potassium. The last-named re-agent draws a sharp line between a platinum print and an ordinary gold-toned photograph, showing a clear distinction in favour of platinum black as against reduced gold, and negativing a direct assertion on this head by Dr. Van Monckhoven.

With regard to chlorine, I found, much to my surprise, that a slip suspended within the neck of a flask from which chlorine gas was freely disengaged suffered no harm; nor even in another trial when, by accident, the print fell into the acid liquid from which the chlorine was being evolved. Further, I am prepared to say that nascent chlorine does not affect the platinotypes unless the conditions are very severe, or such as to bring about an actual disintegration of the paper, as by the attack of warm aqua-regia.

I may state that whole prints freely exposed in a damp atmosphere since October last, and under climatic conditions allowed to be unusually severe, do not yet show any signs of alteration. There has been no opportunity of my trying the effect of sunshine, and in the instances just mentioned I purposely kept the prints away from laboratory fumes, in order to test the stability of the proofs under the normal conditions of a London atmosphere. We come now, finally, to the question of sulphuretted hydrogen, and here I perceive a possibility of effects being observed which lend, for the moment, support to Dr. Van Monckhoven's objection. Sulphur alone does not attack the prints, nor does sulphuretted hydrogen; but when some of the prints are exposed to hydrosulphide of ammonium, the high lights of the picture undoubtedly suffer, as though, by imperfect washing, traces of platinum and iron salts had been allowed to remain in the pores of the paper. The effect is not disastrous, for I sometimes prefer the warmer tone thus induced—even though it be at the expense of brilliancy in the whites—to the cold ink-black tone of the true platinotype, and consider that further experiments in this direction may point the way to a method of toning which, for portraiture, might possess certain advantages. If, however, these germs of alterability are to be excluded, nothing is easier than to give the prints an extra wash in dilute hydrochloric acid after leaving the oxalic bath; and, in fact, to pay as much attention here to the removal of ferric salts as we are accustomed to do in the way of measures of precaution against fading in our ordinary practice.

Postscript.—It has occurred to me, since writing the above, that the use of plumbic chloride, mentioned in the patent specification as sometimes employed, might account for the darkening of those prints which were found to be affected by alkaline sulphides. A further examination shows this to be the case; for when the lead was extracted by washing the prints in dilute hydrochloric or nitric acid, the platinotypes were proof against the attack of this, as well as of all the other chemical reagents tried. It would be very desirable to abstain altogether from the use of lead compounds in the preparation of paper intended for the reception of permanent records, and if a mineral basis is absolutely required, zinc or barium should be tried instead. With this simple modification I consider the platinotype will stand favourable comparison with any known process of permanent photography.

The "Topic of the Day" next week will be "On Proportion in Portraiture," by Mr. Valentine Blanchard.

Correspondence.

ILLUMINATION FOR DEVELOPING.

Dear Sir,—I find the greatest convenience and comfort by using *gas light* outside the dark-room, with a good-sized square, say 24 by 24, of ruby glass, *ground, or smoothed on one side.* A large quantity of excellent non-actinic light is thereby obtained of a quality for developing that is perfectly satisfactory with the rapid dry plates. Artificial light may be maintained at precisely the same standard all the year round, thereby rendering development more easy and certain, whereas natural light varies every hour and every season. Any photographer who will try this plan will be pleased with the result.—I am, yours sincerely,

F. Parsons.

REDUCTION OF GELATINE NEGATIVES.

Dear Sir,—Can you, or any correspondent, let me know how to reduce a gelatine dry plate that is too dense?—Yours truly,

J. L.

[Perhaps some of our correspondents will kindly give their experience.—Ed. P.N.]

GELATINE EMULSION.

Dear Sir,—I know you are always willing to assist one in difficulties. I have been making some very good working bromo-gelatine emulsion, and get some good pictures with it; but I am always troubled with the plates looking *green*, and sometimes they show a *redness*, but I never fail to get a picture. Can you tell me the cause? I use Nelson's specially-prepared gelatine—the best bromide of ammonium I can get; it costs 9s. per pound—and I emulsify for four days at a temperature of about 100°. If you, or any correspondent, will assist me, I shall feel grateful.

I have had some of Tear's emulsion, and that has produced a fine brown tone. I want to get the same, if I can.—Yours faithfully,

Emulsion.

Proceedings of Societies.

Photographic Society of Great Britain.

The annual meeting of this Society was held on Tuesday, at Pall Mall East, James Glaisher, Esq., F.R.S., President, in the chair.

Mr. C. M. Holden-Hambrough was elected a member of the Society.

The meeting then proceeded to the election of the officers of the Society, with the following result:—

President—James Glaisher, Esq., F.R.S.

Vice-President—T. Sebastian Davis, F.C.S.

Treasurer— John Spiller, F.C.S., F.I.C.

Council—Capt. Abney, Capt. Brownrigg, and Messrs. Bird, Hughes, Payne Jennings, H. P. Robinson, and C. Bennett.

The President then said that before proceeding to the business of the evening, he felt it his duty to allude to the loss the Society had sustained in the death of Mr. George Wharton Simpson. He remembered Mr. Simpson in connection with the Society ever since the days at King's College, and had ever held him in high esteem and respect. He was quite sure that every one present would join with him in expressing the deepest sympathy with Mrs. Simpson.

The Hon. Secretary (Lieut. Darwin) read the annual report of the Council, which stated that the proceedings of the year just concluded had been exceedingly satisfactory. There had been an increase of forty members, and the Exhibition had been more than usually successful. The letting of wall space to non-members had also answered well.

On the motion of Captain Abney, seconded by Mr. Sebastian Davis, the report was adopted.

The Hon. Treasurer (Mr. J. Spiller) then submitted the annual statement of accounts, which showed that the balance of £215 11s. 3d. standing to the credit of the Society at the end of 1879, had been increased to £225 11s. 7d. The receipts were:—Entrance fees and subscriptions, £283 9s. 3d.; sale of Journal and advertisements, £72 12s. 4d.; admission to Exhibition, sale of catalogues, and letting of wall space, £148 3s. The assets, consisting of entrance fees, subscriptions due, outstanding advertisements, and wall space, furniture, and the balance in hand already mentioned, amounted to £331 8s. 4d.

A vote of thanks was passed to Mr. Spiller for his services as treasurer, and also to Captain Abney as editor of the Journal.

Dr. Huggins then explained his method of "photographing the spectra of the stars." He pointed out the difficulties to be

overcome; one arising from the extreme faintness of the light emitted by the stars in dispersion through the prism, and the other from the apparent motion of the stars being different from the earth's rotation. By means of diagrams Dr. Huggins described the apparatus he had devised to overcome these difficulties, the two points arrived at being the construction of an instrument which would give a detailed spectrum with the smallest possible loss of light, and the other to have such an arrangement as would enable the image of the star to be placed exactly on a space not larger than the 350th part of an inch, and to maintain it there during a photographic exposure, the time of the latter being sometimes as much as two hours.

Several photographs of spectra of stars were handed round for inspection, and after some remarks from Captain Abney, in the course of which he proposed a vote of thanks to Dr. Huggins,

Mr. J. H. Dallmeyer said the subject was one of the highest importance to photography, as the latter was a new agent in spectroscopy, and the camera could now show us what the eye could not see. The point, however, of greatest interest to him (Mr. Dallmeyer) in the results obtained by Dr. Huggins was that they gave us, as it were, some idea of the age of our sun as compared with other suns. Dr. Huggins had shown how the sun had altered, and probably by extending his researches, as he had indicated those suns which were beginning their existence, he would also be able to indicate those which were ceasing to be.

Captain Abney then read a paper on "Printing by Development," in which he stated he had been led to make experiments on account of the liability of the waxed paper used in the Meteorological Department to turn black in times of electrical disturbances of the atmosphere, and just when it was most necessary to obtain observations. The formula recommended by Captain Abney was:—

Potassium iodide	4 parts
Potassium bromide	25 ,,
Distilled water	2 ounces

and a solution of alcohol and iodine added until the mixture was coloured. After immersion the paper, when dry, was plunged into a bath made acid with acetic acid for two minutes, and after the brown colour had disappeared for two minutes longer. The developer used was ferrous oxalate, and this he found gave excellent results. He claimed for the process rapidity, permanence, and a power of obtaining almost any coloured print. Captain Abney then proceeded to the demonstration of his process by developing a couple of prints which had been exposed for twenty seconds in gas-light under a negative.

Mr. S. Fry adverted to the extreme importance of a good printing process by development in these days, when so little dependence could be placed on albumenized paper.

Mr. Berkeley observed that some three years since he had made a few experiments with developing prints on albumenized paper, using hydro-sulphate of soda. He got fairly good tones by transmitted light, but by reflected light they were of a greenish olive brown. He got better results with bromide and chloride together, and with bromide of ammonium alone the tones were red.

Captain Abney also exhibited a negative which had been intensified in 1867 with iodide of potassium and bichloride of mercury, and which during the last three years had turned of a faint yellow colour.

Mr. Bird then proposed, on behalf of Mr. F. Bedford, whose health would not allow him to speak, a vote of thanks to the President for his services during the year, after which the meeting adjourned.

South London Photographic Society.

A meeting of this Society was held on Thursday, February 5th, in the rooms of the Society of Arts, Adelphi; the Rev. F. F. Statham, M.A., President, in the chair.

After the minutes of the annual and popular meeting had been read and confirmed, Messrs. J. W. Wilson, E. C. Eames, and Adam Distin were duly elected members.

The Chairman made a few remarks about the artistic competition, and stated that although the weather had been so unfavourable, the specimens shown as the result of the first month were anything but discreditable to the Society; he also had decided upon the word "Desolate" for the title of this month's picture.

The President then said a few words relative to the death of the late G. Wharton Simpson, stating that his having belonged to the Society from the first had endeared him to a great number of its members; therefore as a friend and companion all had sustained a great loss. Many who knew him intimately would remember what a vein of humour would sometimes pervade his kindly speeches. He (the President) trusted that his place would be filled by some of the younger members, and so carry on the work he had so ably commenced; but still he felt inclined to say, in the words of Shakespeare, "the world will never see his like again."

The President then proposed that the Committee send a letter of sympathy to Mrs. Simpson.

Mr. Howard, in seconding the proposition, said that the letter should not only emanate from the Committee, but from the whole Society. Many, no doubt, had had more opportunities of coming into closer contact with the late Mr. Simpson than he had, but he could say that he was a most genial friend, and on the recreative occasions he had met him he found him endowed with great capacities for enjoyment.

Mr. E. Foxlee, as an old member of the Society, endorsed all that had been said of the late Mr. Simpson.

The President then vacated the chair in favour of Mr. F Howard, and read a paper entitled "Photographic Surprises."

Mr. F. Howard said that the drawing of caricature portraits in the publications devoted to that class of work had been much improved by the aid of photography. The gelatine process would also help in producing humorous pictures, as some would recollect an instance shown in the last Photographic Exhibition, also one displayed at the Lantern Meeting in January, by the effect of heat applied to the gelatine plate.

Mr. E. Cocking said that the subject was not opposed to Fine Art, because it required a knowledge of Art to be able to produce a good caricature; but how far the camera could be made to produce similar results he could not say. The great difficulty would be to find models upon whose faces could be induced the comic expression to be retained. He thought there was a feeling amongst the public for such a class of work, but it must be done most carefully, and would require cultivated talent to ensure success.

Mr. F. Eliot thought the new rapid gelatine plates offered great facilities for taking the human face either laughing or otherwise.

Mr. Payne Jennings said all would approve of the paper, but in caricaturing, all must avoid anything approaching vulgarity, and that as much skill was required in that as in higher branches of the art.

Mr. Statham, in reply, stated that a photographer could, if he wished, libel a person as much in a photograph as ever he could by words. Models would be required who had command over their features, also rigidity of muscle would be necessary. Mr. Adam Diston, who, he would say, was an honour to have as a member, had shown many pictures of a humorous kind. He would, therefore, advocate making portraits less stiff than had hitherto been the case. It was quite possible to make an amusing picture, and at the same time show an amount of high Art.

Mr. Pearsall also said a few words on the subject, and after a vote of thanks to Mr. Howard for occupying the chair, it was resumed by the President.

Mr. E. Dunmore then showed a Kinnear camera with an adaptation for shortening the bellows for short focus lenses.

Mr. F. Howard showed two gelatine negatives that had been intensified with mercury and iodide of potass, and after exposure to light for some time showed distinctly that the density acquired had faded.

Mr. E. Dunmore said the same would apply to collodion, and instanced the case of a negative with clouds painted on the glass, and after some months of printing, the clouds being removed, those parts covered by the paint were much denser than the other parts of the sky.

Mr. A. Cowan showed some prints from negatives developed by oxalate of potass and sulphate of iron, but he did not find much benefit.

Mr. Pearsall promised to read a paper at the next meeting relative to colours applied to photography, and the meeting was then adjourned.

Liverpool Amateur Photographic Association.

The following is a condensation of the Inaugural Address read by the President at the monthly meeting held on the 29th ult., at the Free Library, William Brown Street.

"In looking back over the past year there are some prominent

points which deserve a few remarks. The use of dry plates—so long the sole privilege of amateurs—is now common among professionals also, and, although not as yet productive of any good, this commercial application of our pet idea must ultimately bring to greater perfection the plates themselves and their development. Of course we speak now of the quick or so-called 'instantaneous' plates. Studying lately the directions given by one maker (Marion) for the development of the 'Victoria' plates, I was struck by the stress laid upon the necessity for weighing and measuring most accurately the quantities of pyro., ammonia, and bromide. I have found no necessity for such scrupulous exactness. All gelatine plates may be developed by the same solutions and the same strength. Experience is worth a hundred formulæ, and is more reliable. The question of light used in the dark room is also worthy of consideration. I have experimented on almost every variety of quick and other dry plates, and have never fogged one except by over-exposure, and I use no shade save the bare gas flame of an ordinary burner, turned low, of course, but sufficiently high to see comfortably. With a coloured light the state of the developer cannot be well noted, and its discolouration often spoils and stains a good negative. It is certain, too, that by a subdued white light one can judge better how to proceed than by a stronger coloured light. Lamps as usually constructed allow white light to escape as well as that intended, and the reflection of the former from walls and ceilings is quite as likely to fog a plate as direct rays from a gas or other flame. We have to congratulate ourselves upon the increased activity of many of our members working in the direction of rapidity; but it would be a great pity if the old processes—tried and proved successful—were lost sight of in the present mania for instantaneity. There are circumstances under which gelatine fails to give the best results; and as yet it can hardly hold its own against the old collodio-bromide or albumen methods, over which we have more control, and in using which we have more certainty of satisfaction."

After touching upon the art aspects of photography, and expressing a hope that the time would soon come when amateurs could have their negatives printed by a mechanical process, the President said:—

"In conclusion, I have to call attention to our position (or want of it) in the last *soiree* of the amalgamated societies at St. George's Hall in December. It was thought (and I am as much to blame as any) that, having no novelties to show, it would be better not to be exhibitors at all. I confess, however, that to me, at least, this absence of a concentrating or combining force made one lose one's *personal* interest in the affair, and that it would have been better to have had even a poor show than to have had none at all. Let us look forward to the next meeting, that we may, by our results during the year, teach our townsfolk that our Association is as full of life as any in Liverpool. Our more social indoor and outdoor meetings have, as Hans Breitman said, 'nefer cum to a het dis year!' This is to be regretted, though not to be wondered at, considering the bad weather we have had. But some look back with longing hearts to our *own soirees*, and wish for a repetition of that pleasant gathering which welcomed lately a brother society. Why should not these be repeated? The year 1879 has been an unfortunate one for all. Let us hope that in 1880 the clouds will clear away and the sun shine the more brightly for our late season of darkness, and that it may be a successful one to all of us, photographically and otherwise."

Considerable discussion followed the reading of the address, chiefly relating to the light used in developing plates; and, in reply to a question,

The President said that he developed about four or five feet from the gas flame, which was turned down low, but still sufficient to see well by.

Several members doubted the advisability of using a naked light in their dark-room, many using non-actinic silk or paper in preference to ruby glass when the light was artificial.

The Rev. H. J. Palmer observed that while he could not endorse all the President said in regard to using a naked gas-light, he (Mr. Palmer) liked to have plenty of light to work by, and had found that orange paper of several thicknesses, according to the strength of the light, was sufficient to prevent fogging both during the making and developing the gelatine plates.

Mr. W. H. Kirkby then read a description of and exhibited his rapid shutter.

Bolton Photographic Society.

The monthly meeting was held at the Baths, on 5th February.

The minutes of the previous meeting were read and confirmed. Resolved that the accounts of Messrs. Parkinson (rent) and Blackshaw (printing) be paid.

The Secretary informed the meeting that Mr. Chadwick, of Manchester, could not attend, and having read his communication, stated that one of the members (Mr. Wigglesworth) would be present at half-past eight o'clock to read a paper on his "Haps and Mishaps in Photography."

A communication by Mr. W. J. Chadwick to the Photographic Journal of 30th January, on the "Formation of Photographic Societies," was then read by the Secretary.

As Mr. Wigglesworth failed to put in an appearance, the meeting resolved itself into a conversazione, during which a discussion took place upon Platinum Printing (specimens shown by the Secretary), the desirability of providing the Society with a developing tank, and the album for the reception of prints required by Rule 17; finally breaking up at 9 p.m., after a most pleasant evening.

Photographers' Benevolent Association.

The annual general meeting of this Association was held on January 28th, the chair being occupied by W. S. Bird, Esq.

The business of the evening was commenced by reading the minutes of the previous meeting, which were confirmed. The balance-sheet having been read and adopted, the Secretary read his report as follows:—

"Gentlemen,—In submitting my report I am pleased to say the balance standing to the credit of the Association has been increased from £57 16s. 3d. to £74 9s., showing an increase of £16 12s. 9d. The donations and subscriptions from honorary members do not reach last year's amount, owing, doubtless, to the fact that the assistants have not at present testified their willingness to help themselves or their more unfortunate brethren by joining the Association. Should they adopt that course, there would be no reason to complain of laxity of support from employers and others interested in the profession. The subscriptions from ordinary members for the year were £15 9s. 6d., and the working expenses £20 11s. 9d. Although the former is not equal to the latter, it is the nearest approach since the founding of the Society that members' subscriptions have made towards meeting expenses. This being an important point, and one to be sincerely desired, it must be viewed with some degree of satisfaction, and, with the fact that the funds now average about £2 10s. for every member entitled to assistance, proves the Association to be in a very healthy state; the only thing to be regretted being that the funds and members are not of greater magnitude."

The Report of the Board of Management was read, and the meeting then proceeded to the election of officers as follows:—

Vice-Presidents—Rev. F. F. Statham and Mr. J. H. Dallmeyer.

Treasurer—Mr. H. Baden Pritchard, F.C.S.

Auditors—Messrs. G. Taylor and L. Sisman.

Board—Messrs. W. S. Bird (Chairman), W. M. Ashman (Deputy-Chairman), H. J. Burton, T. Bolas, J. D. Fage, J. A. B. Hall, E. D. Lavender, J. O'Connor, H. Rheinlander, H. J. Thorne, A. Strivens, and R. E. Wilkinson.

Secretary—Mr. H. Harland.

Messrs. Rice and White were elected as ordinary members.

Upon the proposition to re-elect the Chairman,

Mr. Bird said that in the face of the report which had been adopted, he felt himself in a somewhat difficult position, and should be unwilling to continue in office. It was disheartening to find after the lapse of six years that the Society had made so little real progress, and he questioned whether a continuance of the movement was not a mere waste of philanthropic effort. There could be no fault with the constitution or the aims of the Society, nor, he thought, with its management. They had trustees and office-bearers whose names alone were enough guarantee of the genuineness of the Society, and every reasonable effort had been made to obtain publicity for their proceedings. These efforts had not been in vain, for the Association had succeeded in obtaining the recognition of the photographic press, in holding annual soirees at the Exhibition of the Photographic Society of Great Britain, and had, he believed, made its existence known throughout the profession. Nevertheless, the report revealed that, with the most economical management possible, the cost of such management had in every year of

its existence exceeded the amount of the subscriptions of ordinary members. It must also be noted that the subscription list of honorary members rather represented commercial houses thriving by photographic custom than any rally of successful photographers themselves to the scheme of the Society. For these reasons he regretted that the report had been adopted without amendment, and that rather the meeting had not felt it desirable to face distinctly the difficulties of the position, and consider if any means were possible to give more life to the Association by a large increase of members. If the members were content to go on without making some special effort to improve matters, he should certainly prefer to retire from the chair.

Mr. Ashman said that he had from its inauguration taken a deep interest in the Society, feeling that the benevolent and friendly objects were certain to recommend themselves to so important a profession, and having put his hand to the plough he did not share the discouragement of the Chairman, but he believed that opinion was becoming more favorable to the infant Society, that it would yet do its work, and he, for one, should prefer to persevere.

In this resolution he was decidedly supported by the meeting.

After some further discussion it was agreed that the Board of Management would seriously consider the desirability of continuing their effort on the possibilities of success, and upon such conditions Mr. Bird consented to fill the chair for another year.

Mr. Bird proposed, and Mr. Ashman seconded, "That the Secretary be instructed to send to the widow of the late George Wharton Simpson, Esq., a letter of condolence on her great loss, which was also felt to be a loss to the Society, which had been frequently benefited by his considerate help and advocacy."

Mr. Ashman proposed, seconded by Mr. O'Connor, "That the best thanks of this meeting are hereby tendered to Mr. Bird for his attendance this evening, and trusts the next annual gathering will show rapid progress in the welfare of the Society."

These resolutions were unanimously carried, and the meeting dissolved.

The Board of Management of this Association held their usual meeting on the 4th inst. at 160a, Aldersgate Street.

Talk in the Studio.

How to Make Gelatine.—Mr. W. Nicholl, of Belfast, writes:—"Procure from the druggist a pound of buffalo cuttings, which should be of a hard, semi-transparent nature. Pick this carefully, and use only the best and cleanest pieces; put them on to boil in a glazed saucepan, and when the water boils take off the fire and wash each piece of skin carefully. Put clean water on, and let it simmer at the side of the fire—not boiling violently, but keep at boiling heat. Put in the boiled skin, and by occasionally taking a small quantity of the solution out and letting it set on a plate, you will see when it is strong enough for whatever purpose you want it. If a large quantity is wanted you can drop a test-glass in and see the strength, and so be able to get the next boiling of exactly the same strength. If boiled in this careful way the size or gelatine will be quite transparent. Of course you must strain through a cloth."

Early Photographs.—There can be no doubt that the first inception of the idea of photography is due to Thomas Wedgwood, the son of the Josiah Wedgwood who revived the ancient ceramic art, and established the English porcelain and earthenware trades. He appears to have first discovered, about the year 1790, the effect which sunlight has upon salts of silver. His health, however, gave way, and his pursuits in this direction were neglected. In 1799 James Watt—then a Birmingham man—visited Etruria, and Wedgwood's discovery was the subject of earnest discussion. In a letter to Wedgwood a few days atfer, Watt wrote, "I thank you for your directions as to the silver pictures, on which, when at home, I shall try some experiments." From this time until 1802 Wedgwood, Watt, and Humphrey Davy seem to have been in close correspondence upon this subject; but Wedgwood's health was uncertain, and he evidently wanted energy. The invention of photography was, however, in progress, and in the number for June, 1802, of the *Journals of the Royal Institution*, is a paper headed, "An account of the method of copying paintings upon glass, and of making profiles by the agency of light upon the nitrate of silver. Invented by Thomas Wedgwood, Esq., with observations by H. Davy."—*Birmingham Daily Mail.*

To Correspondents.

R. R. R. R.—We have looked carefully through the prints, and if they are your first essay with dry plates, we presume gelatine, they are certainly good. But they might be better both in respect to exposure and development. They are over-exposed in nearly every case. We do not know if you develop by a constant artificial light, but you should do so. The development is only a question of practice, and then some plates might have been more vigorous. With the posing and lighting, there is nothing to find fault with. We hope you will not be offended at our frankness.

Emulsion.—You will see we have printed your letter, as it raises several points of importance.

Landscape.—We should think, if anything, transfers fixed with cyanide are more permanent, but we do not like cyanide. The gelatine emulsion should, in the hands of a tolerable manipulator, give as sensitive films as those you buy, but of course there is a little more trouble. Any rubber manufacturer would sell you sheet rubber, but mind it is free from sulphur, which all vulcanised material contains. Try Britannia Rubber Co., Cannon Street. Consult Meagher or Fallowfield; either will tell you at once.

H. Wilson.—Byrant and May sell the luminous match-box. The agents for the luminous paint are Messrs. Ihlee and Horne, 13, Aldermanbury.

Silver Printer.—No doubt it *could* be done, because, as you yourself show, there are 1,440 minutes in the day. It would be *possible* to get off eight a minute, but a very skilful staff would obviously be required. We ourselves would rather not undertake the job.

Captain Turton.—We will endeavour to get his address for you. The Woodbury Company would, no doubt, undertake the work, and might possibly also be induced to do as you wish.

R. A. Paul.—The frilling of gelatine plates takes place when the gelatine has not been tanned; dip them in an alum solution. Do you mean a matt surfaced print or negative?

Drawback.—Canvas, like rope, shrinks when wet and expands on drying; hence your difficulty. It is very likely that the addition of a little castor oil—very little—will overcome the defect.

Rembrandt.—If you have our Year-Books you will find several articles on Rembrandt pictures. Light blue is a very good colour, and one often adopted. Dark green curtains should answer the purpose of cutting off light very well. Read our "At Homes;" but we will consider your suggestion, and thank you for it.

A. M.—

Bichlor. iridium et potass. sat. sol.	...	1 drachm
Water	...	10 ounces
Gold	...	1 grain

First can be obtained at Johnson and Mathey, or any good house. Transparency, after fixing, to be well washed. Toning to be carried on until both sides of film are alike; if too heavy in deposit, weaken.

F. Heales.—The platinotype process may be practised by licence. See our advertising columns.

A. A.—We suspect you allude to carbon prints upon porcelain. You can easily obtain porcelain, or pot-metal, as it is called, from any of the well-known glass makers.

Sol.—Yes; for very large size plates, and when the negatives are likely to be valuable.

Barnstaple.—Do not albumenize; simply run on the gelatine emulsion. Neither is there any reason for getting the plates so highly polished as in the case of collodion.

James.—In any case you are not the sufferer; so why should you complain?

Z.—Any member who pleased could have sent in a Nomination Paper. Why did you not do so, if you had an opinion one way or the other? We do not know how many years, but, as President and Vice-President, not less than fifteen.

F. Jordan.—Mr. Woodbury would tell you. Send us a note, and we will forward it.

F. W. Broadhead.—Thanks, but you enclose nothing.

W. Salmon.—Next week, we hope to have room.

Yalnif.—Next week.

J. Kemmerell.—No 1 is a respectable house, certainly.

L. B., H. W., W. W., Photophilus, J. Streathfield Cox, W. H. P., and others in our next.

Several correspondents in our next.

PATENTS.

COMPILED BY MR. DES VŒUX,

Patent, Trade Marks, and Photographic Copyright Office, 32, Southampton Buildings, Chancery Lane, London.

No. 408. Thomas Henry Blair, of Franklin, State of Massachusetts, United States of America, "Improvements in Photographic Apparatus." Dated 4th February, 1880.

The Photographic News, February 20, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Mr. Ritchie's "Arabin" Emulsion Process—Photographs in Natural Colours—Luminous Paint.

Mr. Ritchie's "Arabin" Emulsion Process.—The protection of an invention by means of a patent is doubtless very often necessary and beneficial to the inventor; but there are cases when it would seem the patent does the very thing it is intended to prevent. Of course, where some particular *design* is patented the protection is effectual; but when the patent consists simply in the use or combination of certain substances, each of which is an ordinary commercial product, the publication is likely to do the inventor more harm than good. Here is a case in point: Mr. Ritchie, of Fenchurch Street, has patented a new method of preparing gelatine emulsion, the novelty in which seems to be the employment of gum-arabic in a peculiar way. Mr. Ritchie takes a certain quantity of gum, and dissolves it in distilled water; alcohol is added, which has the effect of precipitating the gum to the bottom of the vessel, and allows the liquid with the soluble impurities of the gum to be poured off. When thoroughly washed by repeated applications of alcohol, it is dried, and can be kept ready for use. To this purified gum the inventor has given the name of "Arabin." When required for use, Mr. Ritchie dissolves a certain portion of the arabin in distilled water, and, after adding alternately certain portions of nitrate of silver and bromide of potassium solutions, places the emulsion thus prepared in a dialyser, and allows it to remain there in contact with water until the soluble salts be passed through the diaphragm. Nothing remains but to add softened gelatine, thoroughly incorporating it with the emulsion by means of a gentle heat, and to pour on glass plates in the usual way. This is Mr. Ritchie's process roughly stated, and we are not going to say it cannot be patented; but what one would like to know is, what is the particular portion protected? Is it the production of pure gum-arabic, the method of adding alternately the nitrate and bromide, or the simple fact of using gum with gelatine? The use of gum-arabic in photography is no novelty, as it forms one of the earliest of the dry-plate processes, and such a careful manipulator as Mr. Russell Manners Gordon, who worked the method extensively, is not likely to have employed the gum otherwise than in a pure state. Of course Mr. Ritchie has a perfect right to protect his "Arabin" process by a patent if he chooses, and we have not one word to say against him for so doing; but it really does seem as if the expense had been needlessly incurred, and that so far as any benefit he is likely to receive from the protection is concerned, he might as well have thrown open his invention to the photographic world free from restriction. The shrewdness of Sir Henry Bessemer in connection with his invention of the well-known bronze powder, which laid the foundation of his colossal fortune, should always be borne in mind by inventors who wish to make money out of their "processes." Sir Henry—then "Mr." Bessemer, spent two years in perfecting his invention, by which he was able to produce at a cost of six shillings the pound a material which formerly could not be purchased at less than five guineas per pound. But he did *not* patent his process, because he knew well enough it could not be protected. To preserve the secret, he designed self-acting machines by which manual labour was entirely dispensed with, and after working the process himself for some time, he took two friends in whom he had perfect confidence into partnership, and for forty years the manufacture has been quietly carried on without a rival in the field. If Mr. Ritchie's process be a reliable one—he claims for it the advantage that the photographer can vary the proportion of bromide and gelatine, as occasion may require, with ease and certainty—it would be better for him to manufacture the plates and sell them, rather than trouble himself about a patent. There is no lack of customers for good gelatine plates.

Photographs in Natural Colours.—For at least five hundred and fifty times some one has claimed to have produced photographs in natural colours. Again the problem has been solved, but with that modesty which all the discoverers of the secret show, the mysterious individual is in no hurry to divulge his name and address, possibly for fear of being inundated with the shoals of photographers who would politely wait upon him and worry his life out for information as to "how it's done." Some one in Paris is said this time to be the genius, and the *Theatre* for this month has been so carried away by the rumour that it has given forth the following astounding intelligence:—"Photographs can at last be taken in colour. Nature has at last undertaken to do that in which art has failed; for there is a vast difference between a photograph in colour and a coloured photograph. Every tint of the complexion and tone of the dress, every detail of fringe, scarf, and ribbon, every flower in the hair and jewel in the hand are reproduced in colour with faultless accuracy. As soon as the business arrangements are complete, the *Theatre* will have the earliest benefit of the new invention that is likely to create a revolution in photography." Wonderful! We can only hope that the *Theatre* will hasten its "business arrangements" as much as possible, and that when they are quite "complete," no time will be lost in creating the "revolution." Every photographer will echo our wish that when this happy period arrives we "may be there to see."

Luminous Paint.—There are, it seems, two patents for the production of luminous paint—an English and a French one. The first was owned by Mr. W. H. Balmain, a manufacturer of chemicals at St. Helen's, who died a few weeks ago. This patent was granted in 1877. The second was obtained early last year by M. Pfeiffer, Col. W. F. McCarty, and the Prince de Sagan. Mr. Balmain's patent is now possessed by Messrs. Ihlee and Horne, of London, who are trying to form a company to work the process. While effectual when there is ready access to pure daylight, it would seem as if the luminous paint would not have much chance of success in the terribly smoky and foggy atmosphere of London and of most manufacturing towns. The French patent probably is designed to meet this difficulty, as the use of phosphorus is recommended when additional intensity is desired. The phosphorescent powder prepared by the French process is stated to be a mixture of chemically pure lime and crushed sea-shells and cuttle-fish bone, which consist of carbonate and phosphate of lime. To these are added calcined sea-salt, sulphur, and sulphides of calcium, barium, strontium, uranium, magnesium, or aluminium, and phosphorus obtained from calcined sea-weed. The composition is now made into a paste by the addition of a varnish such as copal, and is ready for use. One of the most useful suggestions by which luminous paint could render valuable service is that of applying it to street names and to the numbering of houses. Names which could be easily read at night would be an immense boon in the metropolis.

PRINT-WASHING APPARATUS FOR AMATEURS.

BY G. C. CUTCHEY.

Get the halves of two butter tubs from your butterman, one larger than the other; carefully clean them. Bore a number of holes in the bottom of the smaller one; place it in the larger tub, on two fillets of wood, so that it stands one or two inches clear of the bottom. Bore three or four large holes in outer tub about two inches from the top; place this apparatus under the tap, turn on the water, put in your prints, and the water will pass out through the bottom of the inner tub, and then through the side of the outer one. Thus your print will always float in fresh water, and I think you will find this is a cheap and effectual automatic washing machine.

At Home.

AT THE AUTOTYPE WORKS, EALING DENE.

We have had the pleasure of visiting in our time the three largest carbon printing establishments in Europe. In 1869 we went down to busy Newcastle at the invitation of Mr. J. W. Swan, and had the good fortune to see the interesting process of printing photographs in carbon as practised by that gentleman. As our readers know, in the Swan process the tissue, after printing, was placed, face downwards, on india-rubber, and when the image had been developed by warm water, transfer paper was put upon it, and then the rubber sheet removed from the back by softening with benzole. The Swan process, if not so simple as that now practised, was thoroughly practical, and gave pictures that bear comparison even with those now produced, facts that were fully borne out by the Braun establishment in Alsace, which worked Swan's patent. This we visited in 1870, when France and Germany were on the eve of strife. The mountain villages, we remember, were teeming with excitement, and the blue hills of Alsace were soon to be disturbed by the rude shock of war. Dornach was a contrast to Newcastle; it is not far from the Swiss border, near Basle, surrounded by wooded slopes and sweet pine forests. At Dornach, the Swan process was to be seen on a larger scale than at the home of its birth. Paintings from most of the European galleries were reproduced by its means, of magnificent dimensions, and we recollect to this day some excellent facsimiles from the Sistine Chapel. The art treasures of Rome, Munich, Paris, and other European capitals were here reproduced in large quantities, and Braun's establishment became famous throughout Europe, both by reason of the beauty of the work, and its permanence.

We were fortunate in being permitted by Mr. J. R. Johnson to see his simplification of the Swan process, when this was still under elaboration at his residence in Brixton, the simplification in question being the germ of the single transfer process. Mr. Johnson's important discovery was the fact that you needed no cementing material to hold fast the tissue during development; if you soaked the tissue in water and clapped it down on any impermeable surface, the image remained on that surface by reason of the atmospheric pressure against it. This fact Mr. Johnson must have shown us more than ten years ago, but it was not until last week that we visited the Autotype Company's works at Ealing Dene, and were gratified with a sight of carbon printing carried on at the present day upon a large scale and under the most favourable auspices. We had expected much, but what we saw far exceeded our expectations.

The Autotype Works are under the direction of Mr. J. R. Sawyer, his partner, Mr. W. S. Bird, occupying the post of general manager in town. The group of buildings at Ealing shelter a *personnel* of eighty, and the manner in which the work is organised and subdivided proves the presence of a master mind somewhere about the premises. A large number of young women find employment in the Works, especially in the retouching, mounting, varnishing, and mechanical-printing rooms; but in the taking of negatives, sun-printing, and development of prints, only assistants of the male sex are employed. Mr. Sawyer was good enough to conduct us personally round the establishment, and if he will permit us here briefly to thank him for his courtesy and attention, we will at once proceed to tell the reader what we had the pleasure of witnessing.

Making the carbon tissue is naturally the first thing to look at. Here is the mixing room, where the proportions of pigment, gelatine, sugar, &c., are mixed, and the bichromate added, when the tissue is to be produced ready sensitized. Carbon tissue, we may inform the uninitiated, looks very much like black court plaister. The pigment mixture, kept at a temperature of something above 120° F, is kept turning in a drum for upwards of an hour to ensure perfect mixing; the pigments employed are Indian ink or vegetable black, with, perhaps, alizarine or indigo, or the oxides of iron or sepia. In the finest tissues for enlarging purposes, only Indian ink is used, for this pigment of all the others is so fine that it may be filtered through cotton wool. The warm mixture is now transferred to a trough in the coating room. Over the trough is an endless roll of paper, and this dipping down into the trough is then passed upwards over rollers. The room is not only maintained at a warm temperature (70° F.), but there is above a huge ventilator with a fan worked by an Archimedean screw, and this fan, carrying away the atmosphere above, causes a stream of warm air to be constantly flowing through the apartment. The consequence is, that before the coated paper has proceeded very far over the roller, the black gelatine has set; the tissue comes running along a travelling bed, and here it is cut into lengths of twelve feet, which, one after another, are taken up by an assistant by means of a sort of haymaker's rake, and hung up to be further dried. In four or five hours the tissue is quite dry. About 1,000 feet a day are made in this room, but with the beginning of spring, when the demands of photographers increase, a second and much larger room is made use of, where 6,000 feet of tissue can be dried at a time.

Here is the laboratory where the transparencies are made for enlargements. This is very delicate work indeed, and is kept apart from the ordinary printing. As we have said, a special tissue is necessary. The glass to receive the transparency is coated with gelatine, which is rendered insoluble; the tissue is printed under the negative to be enlarged, coated with collodion, moistened in cold water, and then developed upon the glass. That a trial transparency has generally to be made first of all, goes without saying, for so much depends upon the transparency; the development takes place within a few minutes of the wet print being put upon the glass—they do not believe in waiting at this stage at Ealing—and is first treated with warm water, and then hot (perhaps 130° F., or 140° F.), for the insoluble gelatine upon the glass surface is a famous material for holding fast the image.

The transparency is next given over to the enlarging and reproducing department, where we meet an old friend, Mr. Burton, to whose management Mr. Sawyer has entrusted this branch of the work. It is a very large branch, and, as in the making of enlargements, it is necessary to have condensing lenses of larger size than the transparencies, the apparatus here is well worth studying. One pair of condensers measured twenty-two inches across, the largest, we believe, made, and they weighed not less than a hundredweight. Oxy-hydrogen lamps are employed for producing the negative from transparencies, the illumination being not only amply sufficient, but more constant than daylight. The plates and baths employed are obviously of large size, and one of the latter we measured was fifty-four inches by forty.

These baths are well worth describing. They are not dipping-baths, but swing on a pivot, so that they may be made to assume a horizontal position at any moment. They are of wood, the interior being coated with asphalte, beeswax, and boiled linseed oil. That they are economical with respect to the amount of silver solution required may be inferred from the circumstance that the large bath, of which we have given the dimensions, requires but five gallons of nitrate of silver; a dipping-bath of the same dimensions would probably require three times the quantity. To use the bath, it is sloped at the ordinary angle of a dipping-bath, when naturally all the solution runs to the bottom. The top side is lifted, and the huge plate laid down upon a series of ebonite pegs; then the bath is turned on its pivot until it assumes a horizontal position, when the

solution at once, in one clean sweep, flows over the plate and remains upon the film as long as the bath is horizontal. After a few minutes the bath is tilted back again on end, and the plate allowed to drain in an upright position and in a moist atmosphere as long as the photographer desires. Thus the bath saves both trouble and silver. In the series of dark rooms there were eight enlarging apparatus, the illumination necessary for developing the plates being provided by a row of gas jets behind coloured glass, the jets being put up and down as occasion required, like the float or footlight of a theatre. Mr. Sawyer had kindly given us permission to note everything we saw or heard, and we at once set about doing our best for our readers. But it was a curious coincidence that our friendly guide always seemed to find most to say when it was darkest, and when, of course pencil and note-book were not to be seen; it might have been accident, of course, but the "flow of language" from our host's lips was never faster than when we visited Mr. Burton's dark rooms.

Another subject of complaint we have. They never photograph anything in a straightforward manner at Ealing. They always appear to be shooting round the corner with their cameras, and, what is more, Mr. Sawyer intimated that it would be a very good thing indeed if other photographers—supposing they desire to print in carbon—were to follow the example. Everything photographed direct at Ealing is taken through the intervention of a mirror, and therefore the lens never points in the direction of the object. A reversed negative is in this way produced, capable of being printed by the single transfer process, and pictures thus printed are likely to be as good again as those developed through the medium of a support. As a matter of fact, there are very few cameras, properly so-called, used at Ealing at all; huge dark-rooms are employed, in which skeleton frames are set up, and these answer the purpose of cameras. Paintings to be copied at Ealing—and they are large and many—are set up in the open air, with a big screen at their back to stop the light; from an embrasure or port-hole in an adjacent wall—of course, at an angle—peep forth mirror and lens, and if you go in to see the camera itself, there is nothing but a skeleton frame, scarcely discernible in the dark, at the end of which is the ground-glass whereon the picture outside is reflected. In a word, the orthodox photographer gets a good deal bothered over the radical way in which the work is done.

There is a fixing-room where nothing but cyanide is employed, and a varnishing-room, heated to a warm temperature, where nothing but varnishing is carried on all day long. There is a retouching-room for negatives—the black-lead pencil and indigo being the materials employed—in which constant employment is found for a dozen assistants; and the finishing-room, with a *personnel* of the same number, where the prints are mounted with starch and finished. The printing-room is a long glass-roofed building, practically contrived, but with little novelty; large tables bearing the printing frames are mounted upon wheels which run on a series of tramways; in fine weather these tables are pushed out into the open air, in wet weather the printing takes place under glass.

The developing-room affords a very busy scene. On either side of a large apartment are water-tanks heated by steam. The carbon tissue—for the most part single transfer prints—are brought here as soon as printed. We saw a picture upwards of four feet long developed. A sheet of stout white paper was placed on a flat board and moistened with water; the big carbon print was thrown into a cold water tank, taken out again, and placed face downwards upon the white paper. The squeegee was used to ensure contact, and then the whole was thrown into warm water. There was no awkwardness about the operation; the tissue gradually dissolved away, and the skilful assistant turned and twisted the huge print, allowed a jet of hotter water to play here and there as occasion required, and, in the end, produced a magnificently toned picture. For copies of engravings, which are but black and white, Mr. Sawyer employs a tissue loaded with pigment, which ensures bright lights and shadows; but in the case of half-tones this description of tissue is avoided. There were prints of sepia, red chalk, and purple, all being developed at the same time. In the case of double transfers, the white flexible support which Mr. Sawyer himself has devised proves invaluable, for not only may you bend a print to your own wish, but the material being white, it permits you to develop as delicately almost as in the case of single transfers which never leave their paper basis.

Of carbons on opal we say nothing, as Mr. Sawyer has promised to describe their production in these columns.

The mechanical printing department, where the collotype process is worked, deserves far more attention than we can give it. We counted no less than twenty presses in full working order, women and men being both engaged upon the work. That the pictures are not equal to sun-printing we admit, but sometimes they approach very close indeed. Some pictures we saw, illustrating a work on India, others included in the "Challenger" Expedition, as also a reprint of the *Codex Alexandrina*, of 1,400 pages—one of the three Greek Bibles known to exist—afforded ample proof of the capabilities of collotype printing.

A sheet of plate-glass serves as the printing basis, and a direct pressure press, and not one with a scraping action like a lithographic press, is employed. The process of preparing the plate is briefly this: A solution of albumen and gelatine mixed with bichromate is poured upon the thick plate-glass, and the light is permitted to act upon this coating through the back. In this way the substratum is rendered insoluble; upon it is now poured a second solution made up of gelatine, isinglass, and a spirit solution of gum, which emulsifies the gelatine. A perfectly hard surface is the result, which is then sensitized with bichromate solution and printed under a negative. After washing, the surface is treated very much like a litho stone, so far as regards sponging and inking are concerned. Mr. Sawyer attributes much of his success in collotype work to having a very thin coating of gelatine upon the glass plate, and employing the Albion press for printing.

Before bidding adieu to our host, we were permitted an inspection of a fine collection of ceramic photographs produced on the Works, of which we hope to say something on a future occasion.

The "At Home" next week will be "At Mr. Alexander Bassano's Studio, Old Bond Street."

ON A NEW RAPID SHUTTER.

BY W. HORSEMAN KIRKBY.*

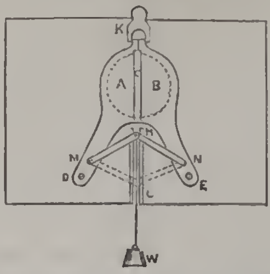
Being interested in so-called "instantaneous" photography, I have examined carefully all the descriptions of shutters that have lately been published, and none of them have come up to my standard of perfection. Now, my idea of a perfect shutter is one that will open with the greatest rapidity, remain open with full aperture of lens for the required period of time, and then shut again with the greatest rapidity. The operator should also be able to know what the time of exposure is, and have means of controlling it.

Before going further I will name some of my objections to several of the ordinary forms. With the drop shutter the larger the diameter of the lens the longer instead of shorter is the drop, and unless it is placed behind the lens the foreground receives less exposure than the distance; besides this, the full aperture of the lens is only in use for one instant, and thus a very small fraction of the whole exposure given.

The lens is closed by two shutters, A and B, meeting

* Read before the Liverpool Amateur Photographic Association.

vertically in the centre of the lens, a thin strip of brass, C, attached to one of them, covering the slit between them. The shutters are pivoted at D and E respectively, and are worked by the rods, H M and H N, which are hinged to-



gether at H, from which point a weight, W, hangs. On lifting the trigger, K, which is horseshoe-shaped, the pivot, H, falls to L, being compelled to fall vertically by two guides, the shutters fly apart and again come together, thus completing the exposure.

I have designed, but have not yet put into practice, an arrangement to vary, as required, the length of exposure by having thumbscrews at M and N, to enable the rods H M and H N to be lengthened or shortened.

In the shutter that I have made the weight falls three inches; therefore, ignoring friction, the exposure is about one-eighth of a second, and I find that one-eleventh of the drop opens the lens to full aperture, at which it is kept open for nine-elevenths, and the last one-eleventh closes it. Consequently, this shutter gives more exposure in a given time than any of the shutters hitherto described. I have only used it once, namely, on New Year's Day.

THE NEW HYDROGEN LINES OBSERVED BY PHOTOGRAPHY, THE STAR LINES, AND THE DISSOCIATION OF CALCIUM.

BY DR. H. W. VOGEL.

In the month of July, 1879, I published in the Reports of the Royal Berlin Academy of Sciences, some photographs of the spectra of Geissler tubes, filled with rarified hydrogen. In these photographs are visible, besides the old well-known hydrogen lines, H, α, β, γ, δ a great many other lines in the violet and ultra-violet at the extreme end, very thin and faint, but of a character very similar to the old well-known hydrogen lines. One of the most intense of these new lines coincided almost exactly with the H line (Fraunhofer) of the sun spectrum.

I inclined to the idea that these new lines, whose wave length I published six months ago, were real hydrogen lines, but an objection was made to the effect that the hydrogen employed would not have been quite pure. I will mention here that I got exactly the same lines with hydrogen of different sources.

I have recently repeated my experiments, and filled Geissler tubes with the purest hydrogen, developed by electrolytical decomposition. The photographs of the spectra of these tubes show nearly all the same lines as I have published, and I venture now to declare these new lines to be *real hydrogen* lines, so that this body, besides its four chief lines in the visible spectrum, has certainly five chief lines at least in the ultra-violet part.*

The wave lengths of these new lines, which I have published in the Reports of the Berlin Academy, 1879, p. 590, are as follow:—

3968 bright lines, coincident with H (Fraunhofer)
3887 ,,
3834 fainter lines
3795 ,,

The fifth line was not very distinct; its wave-length, which I have not published till now, is nearly 3770.

I have received *Nature*, which contains an abstract of Huggins' highly interesting paper read before the Royal Society on the photographs of the spectra of stars. Huggins gives a list of the wave lengths of the dark lines he obtained in the ultra-violet part of the spectra of white stars, and I was much astonished to find that they corresponded almost exactly with my hydrogen lines above mentioned. I put here Huggins' and my own numbers together:—

Huggins' star lines in the ultra-violet-wave length.	My hydrogen lines in the ultra-violet-wave length.
3968	3968
3887·5	3887
3834	3834
3795	3795
3767·5	3770

This conformity is so surprising that I venture the conclusion that the *chief lines of the spectra of white stars are hydrogen lines.*

Lockyer, whose admirable investigations I highly esteem, but with whose conclusions I cannot agree, regards the line 3968 (coincident with the calcium line H, Fraunhofer) in the star spectra as a calcium line, and deduces a dissociation of calcium from the fact that the second calcium line K is not visible in the star spectra. My opinion is that the line 3968 in the white star spectra is *not* a calcium, but a *hydrogen line*, and I base this theory on the fact that the well-known hydrogen lines in these spectra are much more intense and thicker than in the sun spectrum. I may point out that this line is not exactly, but very nearly, coincident with H (Fraunhofer); the first is a little less refrangible.

Lockyer supposes that calcium is also dissociated in the sun's atmosphere. He mentions the observation of Professor Young, who observed the H seventy-five times and the K line only fifty times in the atmosphere of the sun. My opinion is that the so-called inversed H line, if visible without K in the chromosphere, is not the calcium line, but the fifth hydrogen line.

IMITATING WATERMARKS IN PAPER.

The following method for imitating watermarks is published in a number of the *Obsor Graphitscheski Iskustvo*, which is particularly suitable for designs, &c., in half tones. A plate-glass plate, with the edges previously ground, is polished with talc, and the ground edges covered with weak albumen, then coated with collodion; afterwards a solution of gelatine, lump-sugar, and bichromate is poured on, so as to cover it equally to the thickness of one and one-half mill. When dry, detach, and expose under a negative in the sun.

In the meantime cover a polished zinc plate sparingly with a solution of gelatine in acetic acid containing a grain or two of chrome-alum; after drying, well wash in hot water and stand up to drain. Now take the exposed gelatine, dip it into alcohol, and, while wet, squeegee it on to the moist surface of the zinc plate; in a quarter of an hour it is ready to develop, and harden the same as for pigment work. When the relief is thoroughly dry, it is only necessary to lay a sheet of fine paper over it, and pass it through a rolling press, to obtain an exact facsimile of the negative.

Our Berlin contemporary for October last contains an example of a similar method to the above executed by Messrs. Werner and Schuman, who have patented the process in Germany under the name of photo-diaphaine.

Herr Meyer has hit upon a plan for producing such watermarks which is novel in the extreme, and at the same time very simple. A print of the required design, either from a typo-block or an india-rubber stamp, is pulled in a very sticky ink on a sheet of glazed wave-paper; over this strew some fine silver sand, and let it dry for a short time then brush off the

* I have only five in my photographs, because I worked with glass prism and lenses, which absorb a good deal of the ultra-violet rays.

superfluous sand, and place a damp sheet of evenly gummed paper carefully over it, and place between the leaves of a letter-copying book to dry under pressure. The matrice so obtained can be used on either side, so that if it is placed between two sheets of paper, and the whole run through a rolling prass, it will give two very good imitation watermarks. This of course has the drawback that it is only suited for line work, but, as Herr Meyer justly remarks, it can be used for a variety of purposes, such as drafts, cheques, &c.; or anyone furnished with a facsimile done in the above manner could use it for endorsing bills, &c., by merely passing the same, together with the facsimile, through a lithographic or rolling press. A good specimen of this method was issued with the article in No. 38 of the above journal.

ART AND ITS RELATION TO PHOTOGRAPHY.

No. V.

BY AN ART STUDENT.

Many instances could be given of paintings particularly worthy of study by photographers, and containing nothing but what might be attempted by the "camera" if directed by sufficient knowledge: Gainsborough's "Duchess of Devonshire," Etty's "Bather" (an extraordinary example of subtle readering of flesh) also his "Window in Rome During Festa." And in the National Gallery, Edinburgh, note Greuze's exquisite tender picture, "Girl Lamenting a Dead Canary," Faed's "Annie's Tryste," and some of Raeburn's portraits, all of which are single or dual compositions that could easily have been produced by photography. I will now try and show practically the method of commencing a picture and bringing it to a successful termination. Imagination is a requisite quality, indispensable. An artist must be gifted with it more or less to enable him to conjure up things as they were or as they are. Suppose, as an illustration of my meaning, that we are going to make a picture, photographic or otherwise, representing a flower girl, such as may be seen any day in summer, selling her roses in Regent Street or Charing Cross. The first matter is to select a suitable model; and here imagination comes in at once, for the model need not necessarily be a vendor of flowers, and in the choosing of a subject we will only have regard to the individuality so far as the person selected carries out our ideas of what constitutes female grace of form and beauty of features, always being careful that a too-refined model is not substituted, or the eye will not (in a certain sense of the word) be cheated into the belief that it is a veritable type of the character you are portraying. As I said in a previous paper, our ideas of perfect beauty can only be gained from a close study of the antique, coupled with keen observing powers; but it would be a palpable mistake to endow a girl who has to earn her bread, with all the graces of a "Venus di Medici;" indeed, owing to the rather penetrative qualities that the photographer's apparatus possesses, it would be almost an impossibility. However, if the model is selected with a view to combining grace and sweetness of expression, the first point will have been attained. From observation, and personal observation only, the artist is supposed to have formed his ideas of what is required to make up the picture. He is well aware that that class are not in the habit of frequenting "marble halls." Velvet curtains, carved furniture, diamonds, and silk attire would be entirely out of place, and simply ridiculous, so he sets about putting all these accessories aside until some duchess favours him with a sitting, when they may with impunity be brought forth. Having clothed the model in garments in accordance with the subject, the next thing is to pose it and arrange the light and shade.

But I must stop here to say a few words regarding draperies. A few years ago, when the hideous crinolines and wide skirts were in vogue with our fair ladies, lovers of the artistic in costume were naturally very much disposed to look upon the then style as something far from prepossessing. The rage gradually died out, and the men milliners began to turn an ear to what artists said, and considered more suitable dresses to show off "the human form divine." Had they followed out the hints given by those capable of judging, a style of garment might have been introduced which, while pleasing the educated eye, would have lent freedom to the figure. Instead of this, however, these gentlemen set their wits to work, and originated the present wonderful "mode," and though, apparently, acting on the rules that were given them, I am sure it was never meant that the costumes were to be made as they now are. One of the maxims in art is, draperies are to show, but not ostentatiously, the living form beneath—that is to say, the garment, or whatever it is, is to fall gracefully and cling naturally round the figure, showing the movements of the limbs, and so disposed that the whole body may have free action, for free action of the limbs is necessary to grace of movement. Now if, in place of doing this, the skirts are drawn deliberately tight around the figure, it is sufficiently plain that it has been done on purpose to expose the form, and descends at once to the level of an artifice, or the reverse of natural. We know when we see a tightly-dressed young lady that her limbs cannot have free action, and consequently her dress does not fulfil our ideas of the artistic; and as regards the many flounces, &c., with which it is not adorned, they are just so many more eyesores. The material of the dress should be soft, the colour blended to suit the complexion, and from the waist it ought to fall down in folds clinging close and looped up in front to show the feet, and without one particle of adornment either before or behind. In fact, the modern riding habit is the nearest approach we have to grace in ladies' costumes.

Let us return to our composition. The model is posed and lighted. No guide to this can be given on paper—it remains entirely with the artist. According as he is gifted, so will he choose that position and light which in his own mind he thinks the best, always striving, however, to throw the light on the most salient points, and sink the awkward ones in shadow, and leaving out all accessories which do not serve to tell the tale. If it is an outdoor view, the figure may be made leaning against a wall. But if a wall is meant, it must be a wall, and not a cloth background. Photographers should be able to invent, or rather make, sketches from nature for their own backgrounds. Thus, what is to hinder them, if competent, sketching a good interior when they see it, and afterwards either painting a background from it, or else making an enlarged copy in black and white of their sketch, then copying by means of lens and camera, and using this negative in combination with that of the figure. If properly done, the effect ought to be far more truthful than placing a sitter against a dummy background the like of which was never seen in nature. Having photographed the model, the only thing to be done will be to adjust the background, heighten the lights, if required, by retouching, try to round the cheek and arms, and remove blemishes; but it is needless for me to repeat that this cannot be accomplished unless the artist has a knowledge of what he is about. The present mounts for small photographs may be handy, but they do not help to throw up the picture. The margin for a carte-de-visite, if three inches instead of a quarter, would lend a far more important character to the work. I am fully of opinion that those who have the genius, and are inclined to practise genre photography as well as portraiture, will, if they bestow time and careful thought, produce pictures equal to our greatest painters, and not go unrecompensed. Subjects worthy of portraying are to be found around us every day, even among the humblest; all that is wanting is the mind capable of reading the histories of love, trials, sacrifices, virtues, and vices that are imprinted upon every brow.

The Photographic News.

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PRINTING IN DULL WEATHER.

The dull days have caused many of us to wish for a more rapid means of printing. We will hope that the long spell of foggy weather has at last been broken, and that we have left the dull days behind us for a season; but it behoves us, nevertheless, to remember that for three months in the year at least we suffer very much by being unable to print with sufficient rapidity. Albumenized paper, sensitized in the ordinary way, is a very slow printing material in the dull winter months, and happy is the photographer who can get off a single full impression from his negative during the short hours of murky daylight which he has seen so frequently of late. The carbon printer is far more fortunate than his old-fashioned brother: in the first place, the pigment tissue is more sensitive; and in the second place, there is no reason for printing a negative fully in the sun, for our readers are fully aware of the fact that if a bit of tissue is exposed under a negative so that it is but half printed, and the bichromated film, thus impressed, is put away in the dark room for a dozen hours, the printing will go on in the dark, and on development later a fully printed impression is the result. You may print in the daylight to the extent of only one-eighth, and a period of something like forty hours passed in the dark room subsequently, will do the rest. The action of the light once set up, it continues in the dark, and will, if the tissue is left sufficiently long, render the whole of it insoluble. This method of printing "in the dark" is carried on in many establishments where the carbon process is made use of.

But the photographer who is strange to carbon printing is hardly likely to take up the process for the mere purpose of tiding over the dull season. Being a silver printer, he naturally wants to employ a silver process which shall be somewhat quicker than the ordinary chloride of silver printing; and how anxiously photographers have been looking forward to a process of this kind during the last few months of gloom was proved at the last meeting of the Photographic Society by the eager way in which the members hailed Captain Abney's paper on that occasion. Mr. Samuel Fry adverted to the extreme importance of a good printing process on foggy days, when so little dependence could be placed upon albumenized paper, and Mr. Berkeley told how he had tried, with more or less success, to hasten the work of printing. There are many processess known to photographers of printing by development, in which iodide of silver is employed, the image being subsequently developed pretty much in the same manner as an iodide of silver collodion film is developed. But prints developed on iodide of silver paper are all very much alike. They have an unsharp, swollen appearance; they usually lack density, and they appear to penetrate into the paper instead of being upon the surface. We are not here referring *bien éntendu* to the process brought forward by Captain Abney on the occasion to which we have alluded, and of which we know nothing at present, but of the iodide processes that have frequently been brought forward for the production of enlargements, either by means of artificial or solar light. These never compare favourably with ordinary prints upon albumenized paper, but photographers are, nevertheless, very glad to get them when printing with chloride of silver is impossible.

But we do not know why bromide of silver paper should not be resorted to. Poor Schulz-Sellac, whose painful and premature death we announced in these pages but a little while ago, did some very good work in his short life, and not the least important of this work were a series of experiments made by him in America upon the employment of bromide of silver paper for printing. At the time of the publication of his paper in the *Mittheilungen* we called our readers' attention to his method of preparing paper, and it has always been a matter of some surprise that so little notice was given to the suggestion. Dr. Schulz-Sellac found that if paper treated with bromide of silver is fumed with ammonia—as is very often done with chloride of silver paper, for that matter—a more sensitive printing surface is produced than the ordinary chloride affords. If three samples of albumenized paper are salted with chlorine, bromine, and iodine salts respectively, and sensitized with a nitrate of silver solution, and subsequently fumed with ammonia, it will be found that on exposure to daylight under similar circumstances the bromide of silver paper is by far the most sensitive, for it instantly colours, and soon becomes blackened. Under an ordinary negative the bromide of silver paper prints twice and three times as fast as chloride of silver paper in the intenser portions of the picture, and this greater sensitiveness of bromide of silver is especially noticeable in dull daylight; even with a petroleum or gas light the bromide paper is impressed somewhat, while ordinary chloride paper is not in the least affected.

Dr. Schulz-Sellac assigned to the excess of nitrate of silver in the fumed bromide of silver paper an important function, and therefore the paper must not be washed after sensitizing, as in the case of chloride paper which is fumed with ammonia. Bromide pictures of this nature may be toned in an alkaline gold bath to a purple tint, but as they sometimes lack the vigour of chloride pictures, Schulz-Sellac suggested the employment of a mixture of bromine and chlorine salts for admixture with the albumen, say two parts of chloride to one of bromide. In this proportion Schulz-Sellac tried the salts, and stated that paper sensitized by them gave very soft pictures under hard negatives, and was capable of being vigorously printed. In one of his last communications upon photographic science, the clever young chemist expressed himself to this effect: "I believe that a mixture of bromide and chloride of silver is destined to play as important a rôle in positive printing as those salts do in the negative process."

Will not some of our energetic manufacturers of albumenized paper try their hands at a bromo-chloride paper? In dull weather photographers would, we are sure, of the two evils, prefer to fume their paper rather than produce prints by development.

Notes.

Professor Hermann Vogel, of Berlin, and Herr Fritz Luckardt, of Vienna, will shortly contribute "Topics."

At the Government Map establishment at Vienna, photography has entirely superseded engraving. The maps are sketched in Indian ink on paper, and transferred by photography to stone or metal.

The first photograph taken in the camera in this country of which we have any record was of Kew Church, in 1827 or 1828, by Nicéphore Niépce, and this historical picture, according to one of the best—if not the best—living authority, Mr. Robert Hunt, F.R.S., should exist to this day in the British Museum. The date is fixed by the residence in this country of Nicéphore Niépce, who lived at Kew.

There is a story attached to this photograph which is well worth repeating. In 1828 Niépce went to the Royal Society of London and asked permission to lay the results of his invention before them, but the Society, through their Secretary, declined the proposal unless Niépce communicated all the details of his process. This the French philosopher refused to do, and relations were broken off. Years afterwards, when Daguerre's invention was declared through the length and breadth of the land, a sun picture was shown to Faraday at the Royal Institution, with the remark that he had never seen anything of the sort before: "Yes, I have," said Faraday; "I was shown a picture of Kew Church by a Frenchman, who told me 'it took itself.'" The Kew Church picture was taken with bitumen of Judea, as we know, while Daguerre's photograph was upon silver, and, therefore, very different; but Faraday's testimony, added to that of Mr. Bauer, the Secretary of the Royal Society, did much in influencing the French Government to grant a pension to the son of Niépce, at the same time that Daguerre was accorded that honour.

Daguerreotype portraits of Daguerre are very rare, but Alderman Mayall, of Brighton, is the fortunate possessor of a very good one.

The Russian Imperial Astronomer has had some difficulty in getting a lens of suitable size for a big telescope he has, measuring something like three feet in calibre. The lens has been cast by Feil, of Paris, and sent to America—to Alvan Clark—to be ground. One of these days we shall have a story called "The Adventures of a Lens."

The *Scientific American* quotes at full length our recent remarks on the subject of banknote forgeries, and is inclined to believe, with us, that it is more difficult to counterfeit finely engraved black-and-white cheques like those of the Bank of England, than one faced with a coloured pattern.

In Mr. Friswell's paper, which will form our "Topic" for next week, that chemist describes a mode of valuing pyrogallic acid which has not yet been published.

We were talking the other day of the practice of photography among Royalty. It is not generally known that the Emperor of Brazil is a man of considerable scientific attainments, and, on a recent visit to this country, spent some time in Mr. Baden Pritchard's Photographic Establishment at the Royal Arsenal. The emperor was particularly interested in carbon printing, and followed the process from first to last with great interest. A collection of photographs representing the present state of the art in Great Britain was made for him by Mr. Pritchard.

The award of the Paget prize of £50 for the best dry process still hangs fire. It is a twelvemonth since Captain Paget so generously placed this sum at the disposal of the Photographic Society, immediately before the great impulse was given to gelatine work.

The employment of bichromate of potash in size for coating walls is frequently made use of on the Continent. In a word, you apply a film of bichromated gelatine, and this gets photographed or rendered insoluble by light. The insoluble film is said to be a good protection in the case of damp walls.

The use of bichromated gelatine in this way will call to mind its employment in connection with the famous pea-sausage during the Franco-German war. The supply of skin failed altogether in the face of the great demands for *Erbswurst*, and the food, after pressing into shapes, was, for an alternative, dipped into bichromated gelatine, and exposed to the action of light. In this way the famous sausages were covered with an impermeable skin with very little trouble.

The *Philadelphia Photographer* has addressed to its readers a circular-letter containing thirteen queries, asking "How business is, and what of it?" Our contemporary is now busy printing the answers to these queries, which demonstrate, says the editor, "that good times are now on hand."

Professor Hermann Vogel, of Berlin, contributes an important paper to our columns this week, in which he goes far to prove that one of the lines observed by Lockyer in his "dissociation experiment with calcium" is but a hydrogen line, after all.

Talking about Lockyer's experiments, which seemed to favour the idea that instead of many elements we possessed but very few, and the apparent confirmation of this view by Victor Meyer, who recently told us that chlorine was not an element, since it was capable of giving off oxygen, we may remark that this last matter seems to lack confirmation; in other words, it is possible that Herr Meyer, carefully as he conducted the experiment, is hardly justified, as yet, in declaring that chlorine is not an element. Therefore we have still to wait for the Deluge.

Many city houses are dispensing with the system of requiring their cashiers and accountants to give security, and, instead, request their photographic portraits. In some of the London banks the practice also obtains of requiring every clerk to deposit a photographic portrait with the directors, a considerable inducement to keep him in the paths of rectitude.

Mr. F. W. Broadhead, of Leicester, has sent us a whole-plate picture of the local pantomime. Harlequin, columbine, clown, and pantaloon strike an attitude in front, and beyond is the transformation scene, with the usual grouping of fairies. The fault we find with the picture is, that while a pantomimic scene is very bright, the photographic result is very dull. But we doubt whether anyone could have treated the subject with more skill than Mr. Broadhead has done, and, knowing his difficulties, we are surprised at the result. He has preferred haziness to painful sharpness, and has thus secured a bit of romance in his picture which, in a sharper photograph, would be absolutely wanting. Many of our readers will remember attempts made in Paris to photograph scenes at the Opera, but these were upon stereo plates, while Mr. Broadhead's picture measures eight inches. By the way, if Mr. Broadhead had been ready with his camera at the Lyceum on Saturday night, he might have secured a picture of some three hundred celebrities in art, science, drama, and literature supping together, that would have made his fortune. Mr. Henry Irving was host on the occasion, and we have never assisted at a more congenial reunion.

An extraordinary prize of 3,000 francs has been awarded by the French *Académie des Sciences* to Mr. Crookes, F.R.S., in recognition of his recent discoveries in Molecular Physics and Radiant Matter. Mr. Crookes was the first Editor of the Photographic News.

A charming picture of a "subaqueous explosion" appears in *Anthony's Bulletin.* It is a photograph by the United States Engineers, showing the effect of a charge of dynamite exploding under water at Willett's Point, New York. The soft white spray, rising, apparently, a hundred feet into the air, is most delicately limned, and altogether the picture vies in beauty with the fine results of a similar character secured by the Royal Engineer photographers in this country.

Our military authorities employ photographs of this kind to measure the energy of various kinds of torpedoes. Landmarks—or, rather, water-marks—are placed about the spot before the explosion takes place, and then the photograph showing the upheaving of water in combination with these "marks" becomes a valuable record. The picture shows the height of the cone of water thrown into the air, as also the diameter of this cone at its base: the displacement of water is then a mere matter of calculation. If charges of various explosives are sent to precisely the same depth, photographs of the explosives will soon tell you which are the most energetic of them.

Topics of the Day.

ON PROPORTION IN PORTRAITURE.

BY VALENTINE BLANCHARD.

Novelty is all-important to those who desire successfully to "shoot folly as it flies." This being admitted, the question immediately arises: In which direction shall we search? Various paths are before us, but there is no art finger-post to guide us. Various experiments have been made during the past few years with varied success to introduce new sizes into photographic portraiture.

Almost immediately on the introduction of the carte portrait many years ago the rage followed, and spread to every country where the photographic art was known. But for many years nothing but the full-length was attempted, and we must all admit that the proportions of the opening in the carte album was all that could be desired for that style of portrait. After a time came repletion. It became possible to have too much of a good thing. It was found that whilst the balloon-like crinoline or the sweeping train could fill out the picture without much difficulty, it required all the aid of balcony and pedestal, and much besides, to sustain with anything like an approach to dignity the knock-knee'd or spindle-shanked aspirant for photographic immortality. A desire to see the features much larger sprang up, and boots and flounces were ruthlessly sacrificed, and the half-length became the fashion, but to give place in turn to the bust. The face, however, still continued to grow with enormous rapidity, and in a short time the head filled up the whole of the album aperture, and the body disappeared altogether.

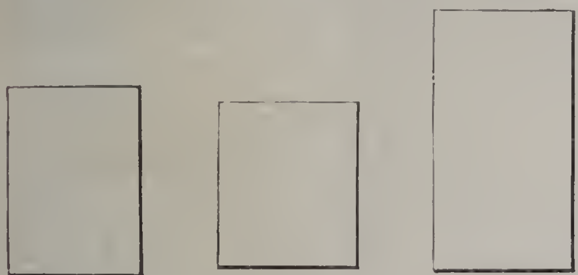
It was during the rage for busts and "Rembrandt" heads that the proportion of the carte opening was found so unsuitable, and the late Mr. Window introduced the cabinet size. This novelty was readily adopted on the Continent and in America, but it made its way very slowly in this country, and it was only in consequence of its success abroad that it finally made headway here. Mr. Faulkner, one of the chief of our art-pioneers, has always protested against the slavish adherence to one size for all proportions of the human figure, and many years ago designed a photographic album, with openings varied to suit the requirements of the bust, the half-length, or the full-length. This he did at considerable cost to himself, and solely with a view to get others to adopt the improvement. His labours have borne fruit. The openings in the modern album are more varied, but still in this direction there is yet much to be done. On glancing at a modern album, one may not inaptly quote Brereton's lines on Beau Nash's full-length portrait placed between busts of Newton and Pope:—

"The picture placed the busts between
Adds to the thought much strength;
Wisdom and wit are little seen,
But *folly's at full length.*"

About five years ago the size known as the boudoir portrait was suggested by me, and considerable trouble was taken by an eminent publishing house in London to make the new picture popular. It has, however, only slowly taken root here, whilst in America, where samples were sent, a modification almost immediately appeared under the title of the "promenade portrait," and in Germany, and more particularly in France, the new size is becoming rapidly popular. Like the cabinet portrait, it seems destined to come back to us from over the water. In the late Photographic Exhibition there were several new sizes introduced by Sarony of New York, which were very much admired.

In this paper I desire more particularly to dwell on the importance of some approach to a rule for guidance. The portrait-painter starts with a proportion for his full-length, well tried and well proven by those magicians of the brush who have left the imprint of their genius on art for

all time. Velasquez, Vandyke, Sir Joshua Reynolds, Gainsborough—these are names indeed. The light of their genius still illumines the path of the artist, be he painter or photographer. All these great painters adopted for their full-length portraits about the same proportions. This will be found to be as nearly as possible a square an l a half, about the proportion of the "carte" and the "boudoir." The "cabinet" will be about a square and a quarter, whilst the new "promenade" size is about a double square. I have arranged these sizes here as a guide to the eye.*



Carte and Boudoir. Cabinet. Promenade.

Now if, in imagination, we fill in the blank frame with the portrait, we shall admit that each in its way is good. For the full-length nothing can be better than the carte or boudoir opening; but attempt to fill it in with the bust only, and want of fitness in the proportion will at once be apparent. Either there will be room left above and below, or the shoulders will be cut off at the sides. If we essay to fill in a full-length standing portrait in the cabinet opening, we shall immediately feel the unoccupied and useless space at the sides; but for the bust or sitting half-length it will perfectly satisfy the eye.

The "promenade" will be found very taking to pourtray the queen of fashion daintily arrayed, and the present fashion for female attire particularly lends itself to this kind of portrait; but for the lesser half of humanity it can scarcely be considered a suitable proportion; and should crinoline ever once more be in the ascendant, a large proportion of the skirt will have to be left to the imagination, or the picture taken twice, to satisfy all the requirements.

On another occasion I hope to take up again this subject of proportion in the photographic portrait, for I feel much may still be said. Those who have watched the painter at his work know how fastidious he is even in the minutest detail which may affect the finished result—how, even at the last moment, he will add a little more foreground, or change, by unnailing his canvas, the proportions of his picture, and this in such a slight degree as to be almost invisible to the outsider. All this only goes to show how impossible it is to be bound down slavishly to certain set proportions. In fact, to be held fettered by laws like those of the Medes and Persians, "which change not, neither can they be altered," is disagreeable alike both to painters and photographers.

FRENCH CORRESPONDENCE.

Transfer of Negatives to Semi-Transparent Paper—New Pneumatic Shutter—Photographic Ornamentation of Silvered Glass—Easy Method of Silvering Glass—Some Observations on Gelatine Emulsions—Intaglio Engraving on Copper by a Photographic Process—Woodbury's Patent Gelatine Process.

Negatives Transferred from Glass to Thin Paper.—At the last meeting of the Photographic Society of France, M. Londe exhibited some negatives transferred from glass to thin semi-transparent paper. He takes a negative printed on a pellicle, which is capable of being used on either side. This negative must not have been varnished, or, if it has been so treated, the varnish must be again removed. He immerses the plate in water with the collodion side upwards, and lays over it a sheet of tissue paper which has been previously coated with a very thin film of gelatine. The two surfaces having been brought into contact, one over the other, and lifted together out of the water, all bubbles or excess of moisture are removed by the application of the squeegee. The whole is now allowed to dry thoroughly, and the sharp point of a penknife is passed round the edge of the plate, when, if a corner be lifted, the negative is easily stripped off the glass, and is found to be transferred to the paper. Of course, if the glass has been rubbed with talc, the transfer is effected with much greater ease and safety. It is but fair to point out that Mr. Woodbury described the same method of proceeding some years ago, and that several persons have practised it, and I only mention it now because I think it is still capable of being employed with advantage.

M. Guerry's Pneumatic Shutter.—At the same meeting, M. Guerry submitted a new pneumatic shutter arranged so as to open and shut in the interior of the camera. An arrangement of this kind has been in use in England for some time, but the difference between the shutter of M. Guerry and that of the English inventor is, that in the former a stopcock is placed close to the bulb or ball, by means of which the shutter can be kept open during the whole time of the pose.* I am not aware whether the pneumatic shutter enjoys an extended use in England, but certainly in France it is scarcely known at all. My own opinion is that its general employment would mark a great advance in photographic portraiture. Since gelatino-bromide plates have come into fashion, and the time of exposure has been so much reduced, the use of a quickly closing and opening shutter possesses great advantage. With an arrangement of this kind, the sitter never knows the exact moment when the impression is taken. The use of this apparatus is therefore calculated to effect a great improvement in portrait photography from an artistic point of view.

Photography Applied to the Ornamentation of Looking Glasses and Mirrors.—Every new industrial application of photography possesses great interest for me. The particular one which M. Leclerc exhibited realizes most charming effects in the ornamentation of silvered glass. Caskets and mirrors decorated by this method are really most effective, and the process can evidently be applied to a large variety of articles. A sheet or plate of glass is first silvered on one of its surfaces; this silvered surface is then coated with bitumen, and when the film of that substance is dry, it is exposed to the light behind either a negative or a positive plate, on which the design is rendered either in line or stippling. When the exposure is sufficient, the parts of the bitumen not attacked by the light are dissolved out by spirit of lavender, or by benzine, or by any other solvent of that substance. By this means parts of the silvered surface are left bare. The glass plate is then passed into dilute nitric acid to dissolve the silver, and when this etching (if I may call it so) has been accomplished, the glass will be left quite bare in all the parts that have not been acted on by light. By applying, now, a coloured varnish to the back of the plate, the picture is obtained standing out of the silvered ground on the looking-glass itself. If the colours, applied to those parts of the glass that have been rendered bare, are skilfully disposed, the effect is elegant and rich in the extreme. This appears to me to be a very perfect method of producing negatives of which the blacks are absolutely opaque, for the light is quite unable to penetrate a film of silver coated with varnish. We have, therefore, a very

* In cutting the blocks, Nos. 1 and 2 have been made slightly too short, but photographers will at once notice this error.

* The Cadett shutter has, of course, a similar arrangement.—Ed. *P.N.*

useful purpose to which M. Leclerc's process can be applied.

An Easy Method of Silvering Glass.—While I am on this point I will give here a simple method of silvering glass for the benefit of those who desire to attempt M. Leclerc's process. Take first a solution of 2½ grammes of silver nitrate in 32 grammes of distilled water, and precipitate by adding ammonia drop by drop, stirring the whole time with a glass rod, until the brown precipitate produced is partly redissolved. Filter, and add enough distilled water to make 50 grammes of solution. For the reducing solution, dissolve one gramme of the double tartrate of potash and soda in 32 grammes of distilled water. Put it to boil in a glass capsule, and add 2 drops of a solution of crystallised silver nitrate in water. When it has boiled for five or six minutes, let it cool, filter, and add enough distilled water to bring it up to 50 grammes. To coat the glass, clean it first with nitric acid, and then place it on supports in a flat dish full of the silvering solution in such a way that its lower surface only touches the liquid. Great care must be taken that no bubbles of air interpose between the surface of the glass and that of the liquid, or they will give rise to bare spots. Sunlight or heat will facilitate the reaction. The liquid will at first blacken during the operation, and will then grow clear again in proportion as the deposition is effected. At the end of from half an hour to an hour the silvering will be complete, though sometimes it takes an hour and a half. When it is quite finished the glass is taken out of the bath and rinsed with distilled water, and so soon as the mirror is dry it is coated at the back with bitumen. If it be intended to keep it as a mirror only, it should be coated with some kind of elastic varnish, not liable to scale off, for if this should happen the mirror would be spoiled.

The Keeping of Gelatine Emulsion.—Piquée, a photographer at Troyes, has observed that gelatine emulsion can be kept under water, and that when it has been kept in this way for a sufficiently long time, its sensitiveness will be considerably increased; this, of course, is owing the fact that decomposition of organic matter is avoided. His experiments have extended over a period of twenty days. M. Balagny, who is a very skilful operator with gelatine plates, is of the same opinion; he keeps his emulsion in a state o coagulation without being compelled to reduce it to the form of pellicle. This object he attains by placing his stock of emulsion in a cool place, and filling the flasks in which it is kept up to the top, so as to expose only a small surface to the air. A few drops of alcohol poured on the surface of the coagulated emulsion materially assists in preserving it, or a small quantity of solution of ammonia has the same effect.

Photographic Etching on Copper.—My attention has lately been drawn to a new process for the production of line or stippled drawings, and as it seems to me to be worthy of notice, I give a short description of it. A copper plate is first coated with bitumen on the turning table, in the same way as in photo-zincography, and when the bitumen is quite dry an impression from a lithographic stone on transfer paper is applied to it; when this paper is removed, we have a copy of the impression in fatty ink on the bitumen surface. This surface is then dusted with fine bronze powder, which adheres to the inked portion, and renders them quite opaque. If, now, the surface be exposed to the light, the bitumen not covered by the powder will be rendered insoluble; on the plate being placed in some solution which dissolves the bitumen, the copper will be laid bare in the parts not acted on by light. These parts can then be etched in by a concentrated solution of iron perchloride, and when the depressions are sufficiently marked, the action of the mordant is arrested, and all the undissolved bitumen is removed. We have in the end an intaglio engraved plate. This process is very well adapted for line or stippled drawings, but it will not answer for the reproduction of those with half tones.

Mr. Woodbury's Gelatine Moulds.—Some remarks in my last letter on the process of M. Hannetier for producing encaustic enamels by means of gelatine moulds have induced Mr. Woodbury to draw my attention to the patent which he took out in 1866 for "producing ornamental surfaces for jewellery, &c." It scarcely needed Mr. Woodbury's remonstrance, as I was quite aware of his priority in the invention, and I merely wished to point out M. Hannetier's process as an industrial application of the ideas both of Woodbury and Poitevin, but not in any sense as possessing the merit of originality. There are so few who endeavour to apply photographic processes on a commercial scale, or for an industrial object, that any attempts in that direction are deserving of all encouragement.

Leon Vidal.

PHOTOGRAPHIC SURPRISES.

BY REV. F. F. STATHAM, M.A.*

By "photographic surprises," I would desire to include an extended class of effects, produced by the aid of the camera, which, in their complete state, serve to excite the curiosity or the amusement of the public, and in some measure to justify the occasionally lengthy correspondence which we have seen in our scientific journals to explain and account for them. They may be said to range from works of such rare art and skill as Mr. Robinson's well known "Gull by the Seashore," or Mr. Gale's "Swallow over the Pool," to such amusing effects as the once-popular "spirit" photographs, or the ingenious "Lapdog" lying on a fleecy rug, which, when turned upside down, presents the appearance of a very grotesque face.

I have purposely mentioned examples at the two extremes—not with any idea of classing the productions as of similar or even comparative merit, but merely to show that photography has in these later days been utilised as well to excite a laudable curiosity as to administer to an innocuous source of amusement. Now I have heard some critics of the severe school denounce all such attempts to stimulate (as they would call it) idle curiosity, or to pander to the mere love of merriment, as beneath the dignity of photography as a science and an art; but I am prepared to argue that this is not a necessary conclusion to be deduced. Take painting, or sculpture, or engraving, for example—universally ranked among the noblest of the fine arts—are their professors considered as demeaning themselves when they leave for a time the higher aims of their profession, and unbend a little for the entertainment of the public?

From Zeuxis and Parrhasius downwards painters have occasionally been in the habit of amusing their leisure hours by some of these playful exercises of the brush. It is clear, then, that painting as an art is not debased or degraded because, occasionally, some of its votaries have indulged in a sportive mood; and did time permit I could show that sculpture also has now and then thrown aside the severer style, and lent itself, even among the ancients, to the purposes of merriment and wit. And the moderns are not behindhand in availing themselves of the same legitimate source of popularity. I take it, then, for granted, that there is nothing derogatory in the occasional unbending of the professors of a high art; and if poets and painters and sculptors and others, exercising what are acknowledged to be the highest professions of art, may do this, why should photography be debarred?

Now I have an object in view in asking this question seriously; for I think it may open up some sources of profitable employment to the profession during their leisure hours if it be answered favourably. One can easily conceive that there are many men who, during the long interval between the close of the autumn and the beginning of spring, in this our cloudy and foggy climate, have many

* Condensation of a communication to the South London Photographic Society.

unoccupied days. Clients are quite willing to visit their studios, and they are quite as willing to be visited, but the "rainy influences" are against them. The one class cannot venture out, and the other could not command sunshine, or even a tolerably clear atmosphere, if they did. What is to be done? Perhaps the artist may have high aspirations. He may say to himself, "Well, it is not very profitable to be sitting still while my rent and taxes are on the increase. I should like to be doing something. I think I could hit upon some amusing device that would please the public, but I must not yield to the temptation. What I thought of is not high art. I shall imperil my reputation if it become known that I have put out such and such a device, however amusing."

It seems to me that if this bugbear were once got rid of, and if many of our photographers would only give a loose rein to their fancies, the public would not fail to appreciate anything that was really ingenious, witty, or humorous, even though it might not come up strictly to the severer standards of the art. We have plenty of Leeches and Cruickshanks and Proctors among the photographic world, I doubt not, if they would only brace up their nerves for the effort; and, for my part, if it were only for variety's sake, I should like to see in my album some humorous sketches or ingenious "surprises" to modify the long array of staid and sober figures which now adorn it.

Correspondence.

PORTRAITURE IN SITTING ROOMS.

Sir,—In my letter which appears in the News of 10th ult., I ask simply for "some directions how to proceed" in taking a portrait in a sitting room, without expressing any opinion on the matter. "Kellim Nuj," however, who seems to be an expert from his own showing in the News of 6th inst., jumps to the hasty conclusion that I think it impossible such a thing can be done. He would have done struggling amateurs, like myself, more good if he had said how to do it, instead of trumpeting forth what he can do.
Yalnif.

REDUCTION OF INTENSITY IN GELATINE NEGATIVES.

Dear Sir,—If "J. L." will make one pint of saturated solution of common alum, and add thereto one ounce of *white* methylated spirit, and immerse his dense negative therein for one hour, at the end of this time most likely it will have become reduced sufficiently; if not, allow it to remain until it has.

With plates made with pure silver bromide, this bath acts with such certainty, and is under such control, that as far as my own practice goes, nothing better can be desired.—Truly yours,
A. J. Jarman.

P.S.—Allow me at the same time to correct a printer's error in my article in the present Year-Book. In the formula for intensifying gelatine (page 65), for iodide of potassium, 40 grains—read 140 grains.

Sir,—As an amateur I have used several dozens of gelatine plates, and have succeeded in getting some good negatives; but I must confess that I have done this a good deal by rule-of-thumb. If the exposure was not quite correctly timed, the negative was never right. I believe that considerable latitude is allowable in skilful hands, but to this skill I have not attained, nor do I expect to do so until I know more of the materials I use.

If any of your experienced contributors would explain the *exact functions* of each ingredient in the developer, it would be of great use to a novice like myself, and perhaps to others.
James Wokingham.

February 3rd.

[We have to regret that by an oversight the publication of this letter has been delayed.—Ed. P.N.]

BACKGROUNDS.

Sir,—Mr. Clark's letter on Graduated Backgrounds gives advice to those not possessing those supposed luxuries. May I offer my plan of producing the same results? Have your background as light a tint as you will ever require it, by shading it at the side with a curtain running on a wire stretched across the studio, at the top, with a curtain on a roller, blind fashion, and by shifting the background nearer to or farther from the light, *any* effect of gradation can be obtained. These are simple mechanical means which save the trouble of doctoring the negatives and avoid the miserable effect of such doctoring, which is almost inevitable.—Yours truly,
W. S.

PHOTOGRAPHIC STUDIES.

Sir,—I see the members of the South London Photographic Society busy themselves with making studies after the manner of the Langham Sketching Club and other artist societies. So far as I understand, the President gives out a subject, and the members carry out the idea in a picture as best they can. If this is so, do you think the Society could be prevailed upon to exhibit the more successful pictures (say) once a year? It would be interesting to many if the members had no objection: and why should they?

Can you get to ask them, or ask the President? I, for one, should be pleased to see what can be done in this way, although I am only so far
A Dry Plate Learner.

PAPER NEGATIVES.

Sir,—Can any of your readers tell me if paper negatives are still made, and if so, where I can buy sensitized paper fit for the purpose? I mean like the old Calotype material. Perhaps you can tell me?—Yours truly,
J. Mutch.

THE NEW PORTRAIT.

Dear Sir,—I see by your issue of the 13th inst., in the article "At Home," page 74, you speak of the London Stereoscopic Company as using the new form of portrait which is usually termed the "Promenade," but which they style the "Boudoir."

I was under the impression that it was generally understood by the profession that the Promenade and Boudoir were distinct sizes—the latter the smaller of the two. I enclose a sample of each. The Promenade style I believe is an American introduction—the Boudoir I am not certain if it be French or English. The first seen by me of this style was made by Valentine Blanchard, London.—Yours truly,
John J. Atkinson.

[See Mr. Blanchard's Topic this week. Certainly it is high time a definite name were given to the new sizes. But we think one new size is enough to introduce at a time, and popular prejudice seems to be for the elongated panel-shaped picture, measuring $7\frac{3}{4}$ by $3\frac{3}{4}$. Panel portrait would be an appropriate name.—Ed. *P.N.*]

Proceedings of Societies.

Bristol and West of England Amateur Photographic Association.

The ordinary meeting of this Association was held on the 19th January, Mr. G. Webber in the chair. The minutes of the previous meeting having been confirmed,

The Hon. Secretary stated that the members would be pleased to hear that applications for space at the forthcoming International Exhibition were constantly arriving, amongst them being a number of foreign ones.

Mr. H. A. H. Daniel read a paper on "Gasholders and Lantern Transparencies," dividing his subject into three sections, viz., lanterns and appliances, lamps and illuminators, and gas holders. He enumerated the various kinds of lights adapted for the purpose, and gave an interesting account of the lamps now before the public. In connection with the oxy-hydrogen lamp, Mr. Daniel exhibited a neatly-constructed "back pressure valve," to prevent the gases passing from one bag to another.

A discussion on the nature of light suitable for the development of gelatine plates brought the meeting to a close.

Another meeting of the Association took place at the Museum, Queen's Road, on Wednesday, the 4th inst.,—Mr. T. Davey in the chair. The preliminary business being disposed of,

The Chairman called upon Mr. G. F. Powell, of Bath, to read a paper entitled "Notes on Stereoscopic Photography."

After detailing certain experiments made with stereoscopic prints, Mr. Powell gave some useful instructions on securing good pictures of this nature. He said:—"Use, if possible, a binocular and two lenses. Much good work has been, and doubtless is, turned out from others; but if anything other than inanimate objects are to be taken it is far easier and more satisfactory to take both pictures at once. Even in some long exposures to inanimate objects, under trees, interiors, &c., it would be almost impossible (with varying light, &c.), apart from waste of time, to do otherwise. I have said 'two lenses,' but of course they should be a pair in all respects; and really a pair of lenses is not so common as what are called 'pairs.' If you have a good pair, by all means keep them. I have tried several so-called 'pairs,' and, although perfect in every way, they have almost all differed slightly in rapidity. This is troublesome, and necessitates a little 'dodging.' Now as to size of plate. I almost invariably use $7\frac{1}{4}$ by $4\frac{1}{2}$ inches; $6\frac{3}{4}$ by $3\frac{1}{4}$ is too near the size you want your mounted picture. Then, again, for copied transparencies; if a $7\frac{1}{4}$ by $4\frac{1}{2}$ negative is cut and copied in the camera, you can get nearly all the plate in on the smaller size, giving fuller detail, and probably a trifle more sharpness. This is a useful size also for a single picture, as most cameras are, or can be, fitted with fronts for other lenses and with movable central division."

Manchester Photographic Society.

An ordinary meeting took place at the Memorial Hall, Albert Square, on Thursday, the 12th inst., Mr. C. Adin, President, in the chair.

The minutes of previous meeting having been read and confirmed, Messrs. George Wardley and Adam Booth were elected members.

Mr. M. Noton then read a short paper on "Coating Plates with Gelatine Emulsion" (in our next), and exhibited a small electro-plated ladle made of a lady's thimble; also a few other pieces of apparatus for the gelatine emulsion process, and illustrated the usefulness of the ladle and other appliances by coating a couple of plates, showing that by this method every plate would be uniform in thickness of film, &c.

Mr. Chilton exhibited a cake of celloidin, the substitute for pyroxyline.

At the request of many of the members, the Hon. Secretary had obtained from the Platinum Printing Company a series of prints produced by their process. They consisted of landscapes, portraits, and reproductions from works of art, which were very much admired for their excellence.

A lantern exhibition was next given in the large hall, and, although not many members contributed to this exhibition, the pictures were of superior quality to those that have been shown on former occasions. Mr. G. A. Brookes, assisted by Mr. W. B. Wood, manipulated the lantern.

A vote of thanks being awarded to Messrs. Noton, Brookes, and others, the meeting terminated.

To Correspondents.

A. J.—Did you wash before fuming the paper? You should have done so.

Freeman.—Employ common salt or hydrochloric acid; either will do.

J. Stokes.—Insufficiently fixed. The yellowness in fabric is certainly due to this.

T. S.—We had better come and stay a week with you; we could then answer all your questions. 1. A rectilinear lens. 2. Either hypo or cyanide of potassium. 3. Dissolve a few crystals of iodine in an iodide of potassium solution, and apply it to the spot; then wash well with hyposulphite of soda solution; finally, rinse well. 4. See our advertising columns about residues. 5. Dissolve in nitric acid, and then crystallize out by evaporation; dissolve a second time in water, and evaporate again. But it will not be worth your while. 6. They are both good makers.

Very Old Reader.—8 feet 6 inches should be high enough, we think. There would be no objection to fluted glass; we have heard of its being preferred, but we will not go as far as that in our opinion.

H. W.—See above. 1. The process has been kept mysterious for some time; but it cannot be patented. We do not know sufficiently to give details. 2. See our "At Home" this week on the subject of transparencies. A gelatine plate put against a negative, and exposed to a bright gas-light for a couple of minutes, will give you a very good transparency. See our Year-Books. 3. The human eye does not give colours like a single lens. 4. We cannot say what lenses Mrs. Cameron employed. 5. You could get a stereoscopic effect in the way you mention, and we do not think the arrangement would be expensive. 6. There is shellac paper which is suitable for landscape work, and is easily retouched.

W. W.—Our experience is against magnesium, which you would not find practical. The Autotype Company employ the oxy-hydrogen light; see "At Home" this week. Unless you have much work to do, it would hardly be worth your while having artificial light.

J. Streathfield Cox.—We have written to Mr. Swan, as your experience is by no means singular. He will probably supply all the information you want.

Dr. H. Vogel.—Thanks for your letter and promise. We will write shortly.

Hypo.—We need not tell you that north light is far the best. Twenty-four feet is not long, although for ordinary work it would, of course, suffice. At any rate, we know of many good studios that are not longer.

Photophilus.—1. Ihlee and Horne, 13, Aldermanbury, are agents for the luminous paints, &c. 2. Chloride of silver has been used in the way you mention. 3. The only photographs in colour that we know of are those taken by Becquerel and Niepce de St. Victor. These were produced with the violet sub-chloride. Until we see others, we shall fail to believe.

W. H. P.—Try a coating of albumen, or the sizing preparation sold by Newman, of Soho Square. We hope shortly to make this subject one of our "Topics."

L. B.—There were two horizontal rods running the length of the glass-room; these carried rings and curtains. An elongated canopy was thus formed, which could be shortened or lengthened at will. The ceiling of the canopy was also curtain material. The camera stood under this, in a tunnel, as it were. But the canopy could be contrived in a dozen different ways.

E. Groves.—Not always. Retouching with the pencil is not so easily done.

A. Z.—They are certainly silver prints; our first reaction told us this.

Instantaneous.—*Atelier de photographie*, Geneva, will find him. There are several other Boissonnas to our knowledge in Geneva.

E. C. Cooper.—We find the Year-Book in question is out of print, but Photographic News of June 4, and Aug. 6, 1869, contain papers on the subject. We will ask our publishers if they can get them for you.

Captain T.—The photographs represent clean work, and are certainly creditable for a beginner. You evidently lack knowledge of lighting, for the light in two of the portraits floods the face, and the outline of nose and other features is not sufficiently marked. You might apply to some of the London leading firms whose names are known, and they might perhaps entertain an offer to assist in their studios for a time. This is the experience you want. A photographer must be something of an artist, and understand lighting and draping a model, to be successful.

John Stone.—We do not think an amateur would require a licence under the circumstances you mention; but write to the Company at address given in our advertising columns.

J. A.—See above for description of screen. 2. Linen covered with thick paper and coated with a varnish should give what you want; the paper might be any colour.

A. Lloyd.—The best account of photo-lithography is that in our Year-Book for 1867, by Mr. Henry Butler. We hope to induce this gentleman to re-write the article up to date; in any case, will promise you a practical *resumé* of the subject in these columns in a few weeks.

Automatic.—Yes, it is. We tried some of it a little while ago, and were quite satisfied. The emulsion may have a dirty look in the dark-room, but this does not interfere with its printing qualities. We think Mawson and Swan are the only makers at present.

Arthur A. Levy.—It is certainly a good photograph under the circumstances; of course, there is a general appearance of lack of light, as if the negative had been secured in a failing light. As a picture taken by ordinary gas burners, it is very praiseworthy, but there are several improved burners now made which would have given better illumination.

J. J. Atkinson.—Thanks for your note, of which the principal part appears in another column. But can we not get backgrounds other than Seavey's of New York, and as good? That seems to be the point.

Captain Turton.—He has left England.

T. W. Green.—It was never published to our knowledge. Write to the intending author.

J. W.—Thank you; we shall always be glad to receive same. You will see it among our "Notes" this week.

A. S. Hale, J. A. Grant.—Next week.

Several correspondents in our next.

The Photographic News, February 27, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Government Grant for Science—Van Monckhoven on the Fading of Platinotypes—Photographs in Natural Colours.

The Government Grant for Science.—It will be in the recollection of our readers that more than once in these columns we called attention to the apportionment to different individuals of the Government grant by the committee of the Royal Society, aided in their deliberations by the presidents of various other learned bodies. The sum of £4,000 a year was guaranteed by the Government to be put in the annual estimates for five years, making in all a total of £20,000 for the encouragement of research. The five years has now nearly expired, and it will be of interest to see if it has stimulated research to the extent that it was supposed it would do; and when we say stimulated, we mean whether it has encouraged those who could not have made researches without its aid. If we turn to the proceedings of the Royal Society, and note to whom the money has been allotted, we cannot but see that there is hardly a name to be found among the recipients which was not known before the existence of this aid to research; in fact, no new blood—or next to none—has been introduced by its means into the ranks of the "Corps Scientifique." Here, then, we have distinct evidence that the grant, as a means of bringing out latent talent, has been a failure. £4,000 a year is not very much for England to expend in the cause of science, but we have no doubt that it might be turned to much better account than by endowing those who without it would do excellent work. How, then, it could be better employed is a very pertinent question; and to this a very pertinent answer, it seems, might be given. If we cross the water, and get to Brussels, we find a Government institution which is supported by a less sum than £4,000 a year. If we turn £4,000 into francs it reads as a bigger figure; and 100,000 francs could well support free laboratories for research in England as it does in the Musée Royale at Brussels. If we had a chemical and physical laboratory supplied with the needful apparatus, of which any one who was gifted with the spirit of research, and on proper recommendation, could be allowed free use, many of the latent "talents," no doubt, would be brought to the surface, and a distinct benefit conferred. There is between this plan and the other at present adopted a distinct difference: in the one case there is no money endowment for research, and in the other there is. At the Musée at Brussels any one has a right to use the laboratories, and, to a certain extent, the privilege is taken advantage of by the class of people for whom such a benefit is intended. The plan of pecuniarily endowing a person for a particular research cannot by any possibility answer in England as well as it does in Germany. Suppose the research takes five years, the endowed person, we will say, has a *modus vivendi* for that period, and afterwards is turned adrift, since it is against human nature to give all the good things of this life to one deserving aspirant, no matter how excellent his work, when perhaps a hundred others are waiting for some of the plums. What is he to do afterwards? Starve, perhaps, in England; whereas in Germany, if he has shown himself capable of good work, one of the many Government professorial posts would be open to him, such as we have not in England. At present, then, we feel inclined to say: Don't endow an individual, but give him facilities for research by means of free laboratories.

Van Monckhoven on the Fading of Platinotypes.—Mr. Spiller's experiments with the platinotype prints were apparently carried out with the greatest care, and it might almost be imagined that he had a prescience of what Dr. Van Monckhoven was going to write. The old proverb about "glass houses" and "stones" is rather applicable to the Doctor and his—may we call it?—diatribe against the platinotypes. Not very long ago he sent a paper to the Photographic Society about carbon printing and ferric oxide as a colourant for the gelatine. Now, of all materials which would be subject to change from sulphur and chlorine, perhaps this ferric oxide is the most liable, and platinum the least. Lord Beaconsfield has told us of the "magic of patience" in politics; "silence" is often magic in other mundane affairs.

Photographs in Natural Colours.—When we called attention to this subject last week, we perhaps were "carried away" by the wonderful announcement made by the *Theatre*, and that put out of our mind something that we had heard before on the same subject; and, after all, it may be that the *Theatre* is a little behind the times. More than six months ago, when we were at Paris, we saw a similar announcement made, and with what trembling expectation did we go to the source of these wonders, and procure four or five francs' worth. Yes, they were really photographs in colours, but scarcely in natural ones. They were decidedly effective, however. We determined to know the secret of their production, and by simple means readily discovered it. The prints were mounted on cards, and one we placed in alcohol, to see what effect that had on the natural (!) colour. It had none. Then we placed in ammonia, and gradually the albumenized surface dissolved away, and still the colours remained nearly intact. But the secret was out. On drying it we found that beneath the albumen surface was a coloured photograph on plain paper, the photograph itself faint, but the colouring strong. The mode of production was easy enough to explain then. A very faint print had been taken on plain salted paper in the ordinary manner. This had been hand-coloured in a rough manner, no attempt at shading being made, but broad washes corresponding to the scarves, the hair, the dress, &c., being laid on; and the eyes—well, they were not artistically coloured up. This print was albumenized with salted albumen, and the surface sensitized again; after that the same negative originally used was placed beneath it, and by an easy process of registration a second print was taken over the first. In some attempts of our own we got very fair results, the shadows, of course, appearing over the local colouring, and giving a most pleasing effect, and one which certainly would have been better had we been more in practice in the "dodging." The difficulty with us, of course, was to get pigments which were insoluble; but as, in all probability, aniline dyes were used, this would be easily surmounted by the use of albumen, or by using a proper mordant. Some little time ago the author of this discovery brought the matter before the Photographic Society of France, and a "commission" was appointed to investigate the matter, and from the wonderful language in which this new process was clothed by the author, such an august tribunal was apparently quite necessary. Denuding it, however, of all superfluous verbiage, the system adopted seemed to be excessively like that we have given above. It, too, is the subject of an English patent, we believe, and the specification, no doubt, will bear out our views on the matter. A City friend of ours lately rushed post haste up to us, and showing us some of these productions, asked if they were really photographs in natural colours. The answer we gave dashed his hopes to the ground, for that very morning he had promoted a limited company to purchase the patent right. Despondently he said, "We should have made half-a-million by it if it had been true." And so they would. The "business arrangements" in that case would have been decidedly satisfactory.

At Home.

MR. ALEXANDER BASSANO AT OLD BOND STREET.

Mr. Bassano's gallery in Old Bond Street at once impresses you with this idea: it is exactly the sort of studio we should all of us like to have. A handsome suite of rooms on the first floor in a fashionable thoroughfare, a *clientèle* that troubles you only in the season, and sitters who do not object to pay well for the attention they receive. Listen to this, good friends, who believe that photographic portraiture is no longer worthily recompensed. "Mr. Bassano's terms are: Two guineas for the sitting, which sum entitles the sitter to either twelve cabinets or twenty cartes-de-visite photographs." This we take from Mr. Bassano's card, and another little bit of pasteboard in our possession, "Appointment for sitting," says: "Should it not be convenient to keep the above appointment, notice must be given to that effect by return of post, otherwise the fee for the sitting will be charged; or the appointment card may be transferred to a friend at the option of the intending sitter."

Mr. Bassano was not only good enough to inform us freely on these points, which may be regarded as the governing principles of one of the model establishments of the West End, but, in reply to further enquiries, expressed a firm belief that if photographers in general would but act as he did, charging a fee for the sitting, and not at the rate of so much per dozen copies, their status would thereby be maintained—an opinion in which we fully concur. Mr. Bassano gives his opinions, as he says, for what they are worth, and, at the outset, we here thank him heartily, in the name of our readers, for placing his experience unreservedly before them.

The reception rooms in Bond Street are a series of well-appointed drawing rooms in which sitters and callers may lounge at leisure. Everything here is quiet and subdued, and if any fault can be found, it is rather that the elegant furniture and soft carpets are a little too quiet. Some magnificent carbon enlargements adorn the walls, rather larger than life-size, we should say, for they are mostly three-quarter portraits, and taken on plates 48 by 36. "People are beginning to find out that silver pictures are not permanent," said Mr. Bassano, "and every day carbon pictures are making headway." A magnificent picture of the Duke of Connaught, and another—this one especially fine—of the Duchess de Marino, may be mentioned as masterpieces, while, almost as a matter of course, there are oil paintings and crayons to be seen, all executed upon a photographic basis. In one corner of the room are three busts, the Duke of Connaught, the Prince Imperial, and John Evelyn, of Wooton, a lineal descendant of him of the Diary, all the personal work of Mr. Bassano, for, like his Parisian *confrère*, Adam-Salomon, our host is a sculptor of some note. But a few minutes before our visit, indeed, the Duchess of Connaught had paid a private call to see her royal husband in plaster.

Mr. Bassano is introducing a new portrait which he terms the Holbein, and which he considers is calculated to show both a full and half-length portrait to advantage; the size is 7½ by 5 inches, and the proportions are certainly very handsome. Photography cannot idealise, but should be "nature apprehended in its most intellectual phase," is Mr. Bassano's view; and there will be but few who do not agree with him. Nothing idealistic ought to be attempted, since the photographer is sure to fail; his province is rather to make a graceful and happy portrait, and with this he should fain be content. A stout scrap-book of large dimensions, such as would not suffer if handled a bit roughly, stands convenient to visitors, and here they can at once see how far Mr. Bassano is true to his principles. It contains a whole series of Zulu heroes: Sir Thomas Pearson, a bluff British colonel; Redvers Buller, V.C., longheaded and intellectual; Chard, of Rork's Drift, the beau ideal of a dashing young officer, &c., &c. A stout scrap-book of this nature is, our readers might note, an interesting item in the reception room.

There is a charming Rembrandt portrait of Mrs. Langtry, a bold picture of H.R.H. the Field Marshal Commanding in Chief, and of other illustrious personages worthy of note. But we must go upstairs to the studio. We leave the comfortable reception rooms—having first signalled our coming above at one of a series of ivory whistles, which plainly betoken system and order—and ascend a broad staircase. We peep into the dressing rooms on our way—all of them apartments of considerable dimensions, for ladies, if in court dress, like plenty of room for their trains and feathers—and then mount once more. There are two studios, lighted from the same direction, N.E. and S.E., so that both ends of the studios may be made use of. In the principal studio—26 feet in length—there was but one background. But it was a long one. It measured no less than 80 feet, and was mounted on perpendicular rollers like a panorama. Its handiness was obvious. As it was deftly passed in review, the tint changed from warm to cold, the scene from outdoor to indoor, and, in a word, progressed through every phase. Mr. Bassano permits the sitter to be in his studio half an hour, and as several pictures are taken, this period he holds to be quite brief enough. It is another matter with a vignette, where, perhaps, but a turn of the head is necessary to alter the pose; but with full or three-quarter length portraits, much time is necessary. Moreover, he believes that the trouble taken is not thrown away, for if you please a sitter, he generally holds to the same portrait year after year, and asks for it to be printed in this style or that, rather than go to the trouble of a fresh sitting. The cameras, by the way, are provided with a square hood or funnel of black, projecting twelves inches beyond the lens, to shade this from the light.

Another point that struck us in the studio was the presence of nought but real furniture. The tables, chairs, and bookcases were real, the piano was real, the Persian carpet was real. The illumination was a high side light, the skirting board coming up about two feet six inches from the floor, and the curtains of blue linen were so arranged that by the lower ones being permitted to rise and the upper ones to fall, you could light the sitter by a central illumination, which central illumination could be high or low as occasion required. Mr. Bassano permits the sitter to be accompanied by his or her friends into the studio; he makes no restriction; they may do as they please. There is a portion partitioned off by curtains where friends may sit, and whence issue the dark rooms.

Of course, Mr. Bassano is fully alive to the advantages of gelatine plates, and considers they were sent as a sort of providence during the recent heavy fogs. But the gelatine films are difficult to retouch upon. Mr. Bassano's work requires a staff of three artists to be constantly engaged on the work of retouching negatives. The ordinary retouching frames are used, and a sharply-pointed pencil, either Wolff's or Faber's. But a B or HB won't do upon a gelatine film. A HHHH pencil was being employed by one artist, and on our enquiring of another if he were using the same, he replied, "No, I am employing a five H point." To give tooth to the film, a little turpentine rubbed on with the finger is found to be most efficacious. The quality of the gelatine negative was exceptionally fine, the film as smooth and harmonious as that of the best wet collodion plate.

Mr. Bassano reserves his Bond Street establishment for photographs taken by appointment, while a second gallery in Piccadilly takes the impromptu work. In Piccadilly there is little else but top light available, but since the pictures taken there have made Mr. Bassano's reputation, we may assume that something besides light is necessary for successful portraiture. The printing establishment, where negatives are sent as soon as retouched and thoroughly

approved, is at Kilburn, where a considerable staff of employés are engaged.

"Secrets? Lord bless you! I have none, I may reply with Addison's knife grinder," was Mr. Bassano's remark, when we asked but for a general view of his establishment. "I have met with some success, but the only secret which has tended to it has been that I have brought to bear upon my work whatever art cultivation, inclination and circumstances have fostered." We have only to assure our readers that what we saw at the Old Bond Street Gallery practically confirms these words.

The "At Home" next week will be at Messrs. Williams and Mayland's Studio, Regent Street.

ON THE PHOTOGRAPHIC SPECTRA OF STARS.

BY WILLIAM HUGGINS, D.C.L., LL.D., F.R.S.*

A SMALL part only of the radiations of a luminous body comes within the power of the eye. There is a large range of shorter vibrations beyond the violet, and also of larger vibrations below the last visible part of the red, which cannot affect us as light. Your distinguished Vice-President, by the discovery of a new molecular condition of silver bromide, has brought these last—the infra-red equally with the former, the ultra-violet rays—within the power of the photographic plate.

The new work, of which I am about to speak, has to do with the more refrangible, the violet, end of the spectrum.

The eye observations of the spectra of stars, which I made some years ago, included the portion of the visible spectrum from about C in the red to a little beyond G in the blue. The photographic spectra begin a little below G, and carry our knowledge beyond O to about S in the ultra-violet.

In endeavouring to obtain photographs of the spectra of stars, two serious difficulties present themselves. One of these arises from the great feebleness of the light of a star after dispersion by a prism, the other from the apparent motion of the star in consequence of the earth's motion of rotation.

It was necessary, therefore, to devise an apparatus which should produce on the plate a well defined spectrum, full of fine details, with the least possible loss of light. As glass is but imperfectly transparent to light beyond the visible spectrum, it was necessary to avoid the use of this substance. The telescope was a reflector of the Cassegrain form, having a metallic speculum eighteen inches diameter. The form of spectrum apparatus is represented in the accompanying wood-cut:—

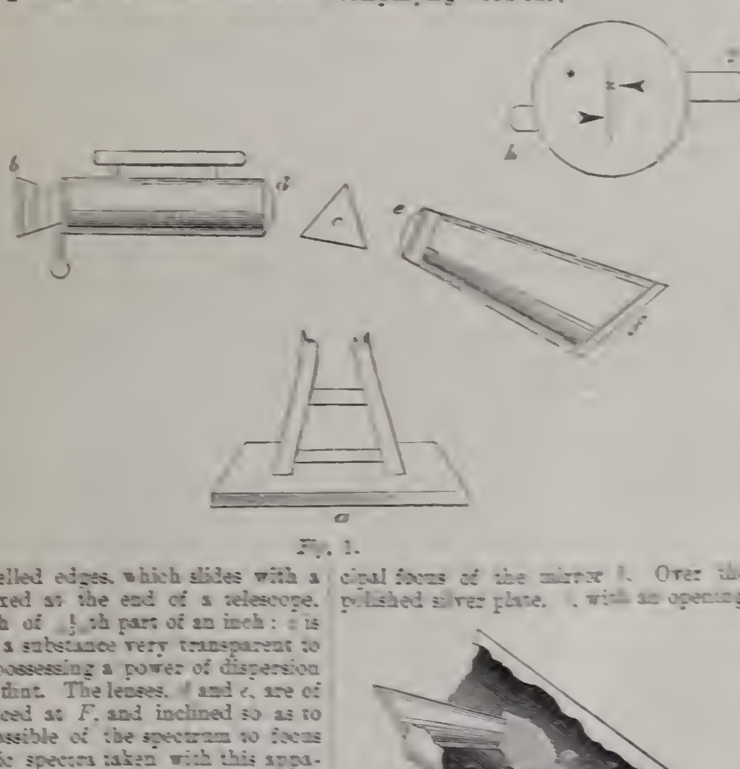


Fig. 1.

a is a base plate with bevelled edges, which slides with a suitably grooved plate fixed at the end of a telescope. b is the slit, having a width of $\frac{1}{500}$th part of an inch: c is the prism of Iceland spar, a substance very transparent to the ultra-violet rays, and possessing a power of dispersion equal to moderately dense flint. The lenses, d and e, are of quartz. The plate is placed at F, and inclined so as to bring as large a part as possible of the spectrum to focus upon it. The photographic spectra taken with this apparatus measure half an inch from G to D, and the definition is so excellent, that seven lines may be seen between H and K in the solar spectrum.

The other difficulty, arising from the star's apparent motion, required a special arrangement to enable the star's image to be brought upon and kept accurately within the very narrow chink, the $\frac{1}{500}$th of an inch wide, through which the light must pass.

In addition to a massive equatorial mounting, and a driving clock of great excellence, due to the inventive skill of Mr. Howard Grubb, the arrangement shown in fig. 2 was adopted.

Fig. 2 shows parts of the telescope. The spectrum apparatus a is fixed so that the slit may be exactly at the principal focus of the mirror b. Over the slit is placed a polished silver plate, c, with an opening corresponding to

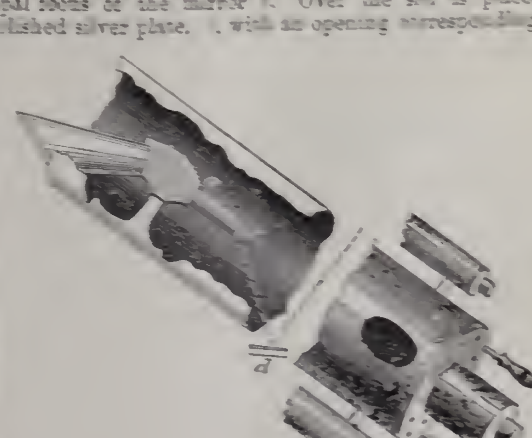


Fig. 2.

the slit. By means of a small mirror, d, artificial yellow light is thrown upon this plate. Behind the hole in the

* Read before the Photographic Society of Great Britain.

centre of the speculum is placed a small Galilean telescope or opera-glass. If the telescope is directed to a star, and the observer looks into this small telescope, he sees the silver plate and the slit within the opening by means of the artificial light. He sees also upon the plate the image of the star as a bright point. It is then within his power to bring this bright point exactly upon any desired part of the slit, and by continuously watching it during the whole time of photographic exposure, which may be an hour or more, to correct instantly, by hand, any small irregularities of the motion of the telescope.

It was necessary, further, to have the means of being able, from comparison with a known spectrum, to determine the wave lengths of the lines in the spectra of the stars. For this purpose the slit was provided with two shutters, g and h (fig. 1). During the exposure the shutter g only was open; when the photograph had been taken this shutter was closed, and the second shutter, h, withdrawn: through this half of the slit a second spectrum was taken upon the same plate. This might be the sun's light reflected from the moon, or the spectrum of a known star, or a terrestrial spectrum, or direct sunlight on the following day.

Various photographic methods were tried, but the great sensitiveness of gelatine plates has led to their exclusive use. For these long exposures, varying from half-an-hour to two hours, it was important to use dry plates.

(*To be continued.*)

NOTE ON STAINS ON GELATINE NEGATIVES.

BY J. W. SWAN.

If photographers would remember that in dealing with a gelatine negative they are dealing with a surface not unlike the surface of albumenized paper, but even more absorbent and more ready to be stained with nitrate of silver, they would, I am certain, never venture to print even a single copy from an unvarnished gelatine negative.

Of course, the thing may be done with extreme care to have paper, plate, and packing all absolutely dry, but if the negative is of the slightest value, take the advice of one who has seen the evil that generally ensues, and do not do it. In nine cases out of ten, spots—simply the result of the "setting off" of the nitrate of silver on the paper upon the gelatine surface—will be the result, and what to do when these spots appear it is by no means easy to say. If they are dealt with before they become deep, probably the best thing that can be done is to place the spotted plate in a solution of hyposulphite of soda, in the hope that the spots may by a prolonged action of the solution disappear before the image is much affected. But this is a mere suggestion; I have not proved its efficacy.

HOW TO TREAT NEGATIVES THAT ARE TO BE PRINTED BEFORE VARNISHING.

BY WILLIAM ENGLAND.*

As it is often desirable to print negatives before varnishing, particularly those taken on gelatine plates, to ascertain if the right amount of density has been obtained, I offer a method which I have had some time in practice. It is well known that, however careful the printer may be, silver stains from the sensitive paper will discolour the negative. To avoid this, I use a sheet of talc (these sheets can be obtained from some gasfitters), but, before using, must be split out as thin as possible, which may be effected by inserting an ivory paper knife at the edge; this done, a sheet is laid on the negative, and then the sensitized paper. Any number of prints may be obtained without the slightest danger to the film. Should, however, many copies be required, it is better to attach the talc to the plate by binding the edges round to keep the two together. Should any of your readers find any difficulty in getting intensity in the gelatine negative, I strongly recommend a formula given by you, Mr. Editor:—

Mercuric chloride	20 grs.
Ammonium chloride	20 grs.
Water	1 oz.

This may be made in quantity, and will keep any length of time. The negative must be thoroughly washed after fixing, then the above solution poured over, which should be left on till the surface assumes a grey tint. Next, well wash the plate, and apply a very weak solution of ammonia and water (ten drops of the former to one ounce of the latter). The negative will now rapidly attain a dark tone on the surface, and on looking through will be a pleasing brown colour. I have tried several methods of intensifying, but with this I have been the most successful. As a rule, I have a strong objection to the use of mercury, but I think this formula gives the most permanent results of any that has been recommended.

* Contributed to the Journal of the Photographic Society.

COATING PLATES WITH GELATINE EMULSION.

BY M. NOTON.*

I have here about one of the simplest and, apparently, most insignificant instruments ever introduced into photography. Nevertheless, it is a most useful assistant in coating plates with gelatino-bromide emulsion, as it does away with all random guesswork, stops waste, and delivers a constant and known quantity of emulsion to each plate; it also saves time, as it is very handy.

It is merely a small ladle, scoop, or measure, made by soldering a handle to a brass thimble, after the fashion of a soup ladle. The thimble holds thirty-six grains of water, equal to one-seventh of a cubic inch—$\frac{1}{12\cdot15}$ths of an avoirdupois ounce, or $\frac{1}{13\cdot33}$rds of an apothecaries' or troy ounce, so that an ounce of emulsion will coat twelve plates $4\frac{1}{4}$ by $3\frac{1}{4}$, or three $8\frac{1}{2}$ by $6\frac{1}{2}$ whole plates. The area of a $4\frac{1}{4}$ by $3\frac{1}{4}$ plate being 13·81 square inches, one-seventh of a cubic inch spread over this surface would give $\frac{1}{96\cdot68}$ths of an inch thick of a wet film; supposing the film to dry to one-third, the thickness would then be $\frac{1}{290}$ths of an inch.

Much will depend upon the quantity of non-volatile material in the emulsion. Pure water, of course, would leave nothing on the glass. Larger plates would require a proportionately larger ladle. After coating some plates I left the ladle all night with some emulsion on the brass thimble, to see if there would be any chemical action between the two. After twelve hours a light green colour could be seen in places, so that one hour in and out of the emulsion will have no detrimental effect; then, when the ladle is done with, a good shaking in boiling hot water will make all ready for the next time of using.

Electroplating would make a good job of these ladles, large or small.

REVERSED IMAGES ON THE NEGATIVE.

BY W. T. BOVEY.

Several years ago I communicated to the News some details of experiments I had made with a view of gaining additional information concerning the nature of the latent image.

Whilst pursuing the researches alluded to, I found that, by an abnormal exposure of a sensitive plate to solar influence, a positive was produced with transparent lights and semi-opaque shadows. Phenomena of a similar kind had been observed by others, and, curiously enough, the cause was attributed to a "reversed action of light." I joined issue with that explanation, and pointed out the de-

* Read before the Manchester Photographic Society.

sirability of simplifying the matter by substituting *continuous* in the place of "*reversed*," as the former word clearly states the cause to which the production of a positive under such circumstances is due. Explaining the conclusions that were suggested by my researches, I expressed an opinion that bromo-iodide salts, when subjected to a prolonged action of the actinic rays, yields up a portion of the bromo-iodine to the free nitrate, and, as a subsalt, cannot respond to the action of the developer.

Bringing the above to bear on the tendency, which in some instances gelatine plates have shown, to develop a positive in lieu of a negative image, the cause of this phenomenal evil can easily be traced to its source. Makers of gelatine plates, in their anxiety to oblige unreasoning customers, are pushing sensitiveness to an extreme which nearly borders on certain failure.

Prolonged cooking induces a too nicely adjusted equilibrium between the bromine and silver, which the faintest ray of actinic light overthrows, and a disintegration occurs similar to the result I obtained by exposing a wet plate for several minutes to bright sunlight; with this difference in the use of dry plates, the gelatine takes the place of free nitrate as an absorbent of bromine.

The remedy for the evil complained of in connection with the so-called "reversed action of light" is obvious. The sensitiveness of gelatine plates must be kept within reasonable bounds, and I would counsel makers to avoid entering into rivalry in the matter of unnecessary degrees of rapidity, until experience has shown exactly how far in this direction they safely might go.

ON A PROCESS FOR PRINTING BY DEVELOPMENT

BY CAPTAIN ABNEY, R.E., F.R.S.*

There has always been a fascination to me in obtaining silver prints by development, and lately my attention has been particularly called to the subject by the Meteorological Office, who desire to substitute some kind of process for the old waxed paper process. It has been found (and I am not at all surprised at it) in excessively hot weather, or weather in which decided electrical disturbances are occurring, that in taking photographic records of the barometer and thermometer, &c., the curves obtained are often valueless, owing to a blackening of the whole surface of the paper during development. This is particularly distressing, since these are the days on which the curves are perhaps most important. I may call the attention of the Society to the fact that these curves are obtained by a point or line of light from some artifical source falling on a sheet of paper wound round a slowly rotating drum, and as any variation in the height of the column of mercury in a barometer or thermometer occurs, or any deviation of the magnet, the point or line of light travels upwards or downwards, and traces a curved line on the sensitive paper, which is subsequently made visible by development. The waxed paper process is a very beautiful process, and where prints are required, the waxing is a desideratum in order to render the paper translucent. The process used at Greenwich is slightly different to that used at Kew; at the former Observatory the paper is not waxed.

Mr. Glaisher, in the introduction to the magnetical observations of 1873, gave the following account of the chemical processes employed at Greenwich:—"The paper used was principally furnished by Hollingsworth and Turner: it is strong and of even texture, and is prepared expressly for photographic purposes.

"*First Operation.—Preliminary Preparation of the Paper.* The chemical solutions used in this process are the following: —(1.) Sixteen grains of iodide of potassium are dissolved in one ounce of distilled water. (2.) Twenty-four grains of bromide of potassium are dissolved in one ounce of distilled water. (3.) When the crystals are dissolved, the two solutions are mixed together, forming the iodising solution. The mixture will keep though any length of time. Immediately before use, it is filtered though filtering paper. A quantity of the paper, sufficient for the consumption of several weeks, is treated in the following manner, sheet after sheet:—The sheet of paper is pinned by its four corners to a horizontal board. Upon the paper, a sufficient quantity (about fifty minims, or $\frac{5}{48}$ of an ounce troy) of the iodising solution is applied, by pouring it upon the paper in front of a glass rod, which is then moved to and fro till the whole surface is uniformly wetted by the solution. Or the solution may be evenly distributed by means of a camel-hair brush. The paper thus prepared is allowed to remain in a horizontal position for a few minutes, and is then hung up to dry in the air; when dry, it is placed in a drawer, and may be kept through any length of time.

"*Second Operation.—Rendering the Paper Sensitive to the Action of Light.*—A solution of nitrate of silver is prepared by dissolving fifty grains of crystallized nitrate of silver in one ounce of distilled water. Since the magnetic basement has been used for photography, fifteen grains of acetic acid have always been added to the solution. Then the following operation is performed in a room illuminated by yellow light:—The paper is pinned as before upon a board somewhat smaller than itself, and (by means of a glass rod, as before) its surface is wetted with fifty minims of the nitrate of silver solution. It is allowed to remain a short time in a horizontal position, and, if any part of the paper still shines from the presence of a part of the solution unabsorbed into its texture, the superfluous fluid is taken off by the application of blotting-paper. The paper, still damp, is immediately placed upon the cylinder, and is covered by the exterior glass tube, and the cylinder is mounted upon the revolving apparatus, to receive the spot of light formed by the mirror, which is carried by the magnet, or to receive the line of light passing through the thermometer tube.

"*Third Operation.—Development of the Photographic Trace.* —When the paper is removed from the cylinder, it is placed as before upon a board, and a saturated solution of gallic acid, to which a few drops of aceto-nitrate of silver are occasionally added, is spread over the paper by means of a glass rod, and this action is continued until the trace is fully developed. The solutions are kept in the magnetic basement, and are always used at the temperatrue of that room. When the trace is well developed, the paper is placed in a vessel with water, and repeatedly washed with several waters; a brush being passed lightly over both sides of the paper to remove any crystalline deposit.

"*Fourth Operation.—Fixing the Photographic Trace.*—The photograph is placed in a solution of hyposulphite of soda, made by dissolving four or five ounces of the hyposulphite in a pint of water; it is plunged completely in the liquid, and allowed to remain from one to two hours, until the yellow tint of the iodide of silver is removed. After this the sheet is washed repeatedly with water, allowed to remain immersed in water for twenty-four hours, and afterwards placed within folds of cotton cloths till nearly dry. Finally, it is placed between sheets of blotting paper, and is pressed."

At the time when these remarks were written many of the various processes at present extant were not known, or were in their infancy. Ever since the introduction of the collodion and gelatine emulsion processes, I have endeavoured to utilize them for printing purposes, but generally without any certainty of results, and I only worked at them spasmodically. Nevertheless, I have some hundred photographs in my possession now which were taken by my registering photometer, and these are fairly successful but not perfect specimens.

(*To be continued.*)

* Read before the Photographic Society of Great Britain.

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STAINS UPON GELATINE NEGATIVES.

Complaints are everywhere rife upon the subject of stains on gelatine negatives. The plates, to begin with, our correspondents assure us, are perfectly free from blemish; but no sooner has a print or two been taken off, than the gelatine begins to show ugly stains. Many photographers, because of the hard and glazed nature of the gelatine film, take it for granted that this may be treated with impunity—that, unlike the collodion film, there is no necessity for protecting it with varnish—and deem there can be no harm, therefore, in putting it in the printing frame at once.

We print in another column communications on this subject from two eminent authorities—Mr. J. W. Swan, and Mr. William England. Mr. Swan thinks that on no account should gelatine negatives be printed without varnishing; and Mr. England recommends the protection of a sheet of talc. The gelatine film, as Mr. Swan points out, is more absorbent than albumenized paper, and if plate or pad be not *absolutely dry*, spots must inevitably be the result. Indeed, the property of gelatine to absorb water is one that the photographer must ever bear in mind. It is not sufficient to immerse it in alum or tan it in any other way; the gelatine thereby becomes insoluble, but it absorbs water just as much as ever. Even when the gelatine is coated with a film of varnish, if this is not of a most perfect character, moisture may not impossibly penetrate and cause spots; and during the recent damp weather, it must have been out of the power of photographers to maintain pads and frames perfectly dry.

If photographers, then, will bear in mind that gelatine—whether soluble or insoluble—is ready to absorb moisture from the air, or from any object with which it comes into contact, we feel sure there will be fewer complaints in respect to spots on gelatine negatives, which, whether they arise during sojourn in the printing frames, or during ordinary storage, are undoubtedly due to the absorption of water.

TESTING GLASS FOR THE DEVELOPING ROOM.

We have frequent complaints regarding the fog produced on gelatino-bromide plates; and where we have been able to get definite answers from our correspondents we have almost always been able to trace the defect to the unsuitability of the glass with which their windows are glazed. We have before us several samples of glass which have been sent us, all of which have been supplied for the dark room, and amongst them we have three specimens of orange glass, and four of ruby glass. We will proceed to show how their efficiency for the developing room can be tested in a very simple manner, with a minimum of apparatus. It need scarcely be said that if any of our readers is in possession of one of the miniature spectroscopes such as those introduced by Browning, the operation is simple enough; but if not, the matter is rather more difficult. To begin with, a prism is a necessity where the optical method is to be tried. It need not, however, be an expensive one, but one of the commonest kind; one of the drops that are to be found on the old-fashioned chandeliers will be found to be perfectly efficient. A lens is also a desideratum—a common spectacle lens of about nine to twelve inches focus will be found to answer the purpose. A sheet of white card completes the outfit necessary for the test. For the card may be substituted the ground glass of the camera, removing the front board, however. We commence by placing a lighted candle some three feet from the lens, which is supported in a piece of card, or by any other ready means which will suggest themselves. The white cardboard, or the focussing screen, is now arranged so that the image of the candle is thrown on it, and the distance roughly measured. At a point between the lens and the screen it will be found that there is a spot where the rays of light cross. This can be ascertained by bringing a piece of white paper towards the lens, and noting where the patch of light is smallest; at this point the prism is placed with its faces vertical, when it will be found that the image of the candle on the screen is slightly deflected, and spread out into the rainbow colours. This is a rough spectrum, which is our method of testing. At any place in the path of the light—a convenient one is between the prism and the lens—the glass to be tested is inserted, and the coloured image of the candle flame is looked at. In the case of the orange glass, we find that we have a red image fading into yellow and green, whilst no blue is at all apparent. If, however, we insert in the path of the rays a piece of ruby glass, we may find one of two things: either a totally red image of the candle flame, or this with a faint blue image. The small amount of blue light is by itself sufficient to cause fog on a gelatine plate, so such a specimen is quite unsuited for the dark room window. If behind such a piece of ruby glass we place a piece of the orange glass, we shall find that the blue entirely disappears, and that a red image alone is visible. The red glass cuts off the green and most of the yellow coming through the orange glass, and the yellow glass cuts off all the blue shown by the red glass; hence a combination of these two is perfectly trustworthy for plates which are so sensitive to yellow rays as are those prepared by the gelatino-bromide process. We would call attention to the fact that all *yellow* glass is not a safe protection, even with the wet process. In some kinds there is an abundance of blue light allowed to pass through, which can easily be seen by the method we have given. One specimen before us is of this class: when held up to the light, it has a most characteristic mottling of dark patches spread over a lighted background of the same tint. Such glass is most untrustworthy, particularly if it has a tendency to brownness instead of to deep orange. In one specimen of canary coloured glass we had—and, from its behaviour, it probably was stained with uranium—the blue ray was entirely wanting; but we found that part of the violet was transmitted, and, of course, fatally fogged wet plates we tried to develop in the white light which was filtered through it.

The brightest admissible light is always to be preferred to any other, and so we recommend our readers to choose a light tinted ruby glass, and combine it with an orange, for glazing their developing rooms. Mr. Thomas has introduced an excellent varnish, stained with some species of dye—probably an aniline dye—with which to coat ordinary window glass; this can be tested in the same method as indicated above, and will be found only to give the red image of the candle flame. Of one point we are quite certain, however, and that is, that whatever glass may be chosen, there is still liability to get fogged pictures with gelatino-bromide if ordinary celerity is not used in developing the image. The great point is to choose a glass, or a combination of glasses, which shall give the *least* veil with the *longest* exposure, and this can be obtained by testing the materials before finally adopting it.

Notes.

The Photographic Club, we are glad to hear, already numbers sixty members.

Among those who are fully alive to the importance of carbon printing is the Queen. Her Majesty has expressed a wish to Mr. Jabez Hughes, of Ryde, that all photographs supplied to her may be printed in permanent pigments.

The Bristol and West of England Amateur Photographic Association are using every endeavour to make their "International Exhibition," to be held next winter, a success. Gold medals and silver medals will be for competition, and already many British and foreign applications have been received from intending exhibitors. The Exhibition is to be held in the galleries of the Academy of Arts, Queen's Road, Clifton, Bristol.

At the commencement of last year the Photographic Society of Vienna published a list of prizes to be awarded in competition for various achievements in photography. The list will be found in the number of the Photographic News for the 4th April, 1879. It was divided into two competitions: in the first, out of the Voigtländer fund, there were offered three gold and three silver medals for various subjects, as well as gold, silver, and bronze medals for papers published in the Society's Journal; in the second, out of the special prize fund of the Society, were offered three gold and five silver medals for similar objects. In all, therefore, the prizes amounted to fourteen fixed and an uncertain number of general medals, for all of which (with the exception of two gold medals in the Voigtländer list) the works in competition were to be sent in by the 1st October, 1879.

Up to that date, however, for all these various prizes only *one* work had been sent in for competition, and that one came from Australia. Nothing daunted, however, by this apparent *fiasco*, the Executive Council of the Society have determined to re-issue the prize list, with certain alterations in minor details, which have not yet been settled. The ultimate dates for the reception of works in competition will also be deferred to some time, not yet fixed, in the present year.

Dr. Huggins' research on star photography is, after all, only carrying out the second line of the nursery rhyme, "How I wonder what you are." If anything will tell us what the stars are made of, the results likely to come of his observations will do so. Mr. Dallmeyer summed up the matter very happily the other night, when he said, "The interest of these photographs and diagrams to me is, that Dr. Huggins appears to indicate the question, what is the age of our sun as compared with other suns, or stars, as we usually call them. Thus our sun is probably getting old, while Ursa Majoris is still young, and Arcturus all but worn out. Probably, by extending his researches, he may find—as he has done in the worlds in being, or beginning to be—suns which are ceasing to be."

The report of the Astronomer-Royal shows plainly enough that photographers must have had rather a bad time of it lately. "Neither sun nor stars were visible for eleven days, during which period the clock times were carried on entirely by the preceding rate of the clock. The accumulated error at the end of this time did not exceed 0·3 second. After a fine autumn the weather in the past winter and spring has been remarkably bad." We hardly wanted an Astronomer-Royal to tell us that.

Photography seems to be making headway at Greenwich, for the Astronomer-Royal further remarks that during the year spectroscopic observations have been almost entirely suspended, in order that the reductions of accumulated photographic observations might proceed more rapidly. Photographs of the sun were taken on 150 days, and 228 of these photographs have been selected for preservation. The photographs show a complete absence of spots on 121 days out of the 150 on which it was possible to secure an image of the sun. Our readers will wonder, we are sure, how it is possible to take solar photographs at all in a murky atmosphere like that at Greenwich.

We alluded last week to the first camera photograph taken in this country at Kew. But we must go back ten years before, to May, 1816, for an account of Nicéphore Niepce's first image secured in the camera, not, however, by the aid of bitumen of Judea, but with silver salts. Whether he used chloride we do not know, but as silver is alluded to in his letters as well as the destructive action of nitric acid, we may take this for granted. The photograph he describes in a letter to his brother, then resident in England; it represented a barn and yard at the back of his residence.

Here is the description of it in Nicéphore Niépce's own words: "The pigeon-house is reversed on the picture, the barn—or rather the roof of the barn—being to the left instead of to the right. The white mass which you perceive to the right of the pigeon-house, and which appears somewhat confused, is the reflection upon the paper of the pear-tree, which is some distance further off; and the black spot near the summit is an opening between the branches of the trees. The shadow on the right indicates the roof of the bakehouse, which appears somewhat lower than it ought to be, because the cameras were placed about five feet above the floor. Finally, those little white lines marked above the roof of the barn are the reflection on the sensitive material of the branches of some trees in the orchard." Lights and shadows were therefore reversed in Niepce's first camera photograph.

Photographers do not always employ patent plate nowa-days, and it is worth while knowing, therefore, how to tell if a bit of crown glass is tolerably well polished. If taken into the glass room where the roof presents plenty of straight lines, and held in a horizontal manner, the surface should reflect these straight lines without any tendency to serpentine or zig-zag.

Photo-relief printing is evidently not losing ground; both the London Stereoscopic Company and the Autotype Company have recently commenced working the Woodbury process.

One of our American cousins makes known the fact that he is in possession of one of the largest studios, and is ready to undertake instruction in photography, especially in respect to the new gelatine plates. We were not aware that the greatness of a glass-house was beneficial to instruction, but since this is so, we ourselves, having attended a lecture on photography in the Crystal Palace, have surely a right to boast of our efficiency.

Moreover, the gentleman who lectured us was aided by a very big assistant, no other than the late Mr. Paul Bedford. Mr. Toole was the lecturer, and we remember to this day with what emphasis he dwelt upon collodion, and on the importance of how to set a plate, although there was no need to set-up-late to do it, albeit photographers talked a good deal about the night-rate of silver. Reverting to largeness once more, the eminent comedian was very strong on the point that not a plate, but a dish, was always required for pictures of considerable dimensions.

They didn't take photographs a hundred years ago, but they employed the camera in making portraits, for all that; and, what is more, there were people in those days ready to call out about the ridiculous attitudes in which the camera always depicted you, just in the same way as there are always complaints at the present moment that photographs never do a person justice. Lawrence Sterne was one of these grumblers, for in *Tristram Shandy* you may read: "Others, to mend the matter, will make a drawing of you in the camera; that is most unfair of all, because there you are sure to be represented in some of your most ridiculous attitudes."

These camera pictures that Sterne talks about were not the black silhouettes our grandfathers and grandmothers were so fond of. The latter pictures were traced with a pencil on a drawing-board, the board fitting upon your shoulder, and a single candle employed to throw the shadow of your profile; the drawing was then reduced, and printed off stone in jet black. Although we cannot ourselves boast of having seen very many winters and summers—as Paul Pry says, they have got so much mixed of late, one can hardly tell the difference—we once had a portrait of this kind made in a remote little corner of Germany, which happened to be a score of years behind the age.

A Frenchman has invented a photographic tell-tale adapted to the steering of ships. A sheet of sensitive photographic paper is set moving in a dark closet under the binnacle, and a ray of light shines through a hole in the compass upon this paper. The more steady the steering, the straighter will be the photographic line recorded upon the sensitive paper.

Topics of the Day.

THE VALUATION OF SILVER NITRATE AND PYROGALLIC ACID.

BY R. J. FRISWELL, F.I.C., F.C.S.

The only articles of commerce which are protected by legal enactments from adulteration are those consumed either as food or medicine. All others are left to the individual care of the consumer, and he must protect himself by the use of such skill and knowledge as his calling confers, aided by such scientific advice as he is able to pay for.

If then he can prove that the article is adulterated, he has a remedy by an action for damages against the dealer from whom he obtained the goods, but the cost and risk involved in such an action are so great that except in cases involving great interests, the wronged party is, as a rule, better content to bear those evils that he has, than to fly to others that he knows not of.

It is, however, very easy to protect oneself, if only the trouble be taken to do so by buying from sample, and if the sample and bulk are carefully valued and compared before payment. It is much to be wished that in the interests of photographers in general, there was among them a more general resort to this method of purchase. Altogether excluding the monetary loss, the expenditure of time and temper, and the harm done by the misleading results which are caused by working with impure substances, cannot be exaggerated.

One of the heaviest items in a photographer's yearly accounts is the expenditure for nitrate of silver. This salt can be very easily adulterated, either scientifically by producing double salts of silver, and sodium, and potassium, or more roughly by the addition of such a substance as nitrate of barium. The first mode of adulteration is not easy to detect qualitatively; the latter may be discovered easily, since the barium salt is exceedingly insoluble in cold water, so much so that the silver nitrate can be entirely washed away from it if cold water only is used. It says much for the easy good faith of photographers that such a mode of adulteration is adopted.

The writer has recently had to examine some samples of nitrate of silver, and the following are the results obtained, given in percentages of pure silver:—

1	2	3	4
51·64	63·39	54·74	63·45

Now the amount of pure silver in pure $AgNO_3$ is 63·52 per cent., so that Nos. 2 and 4 were really what they professed to be, pure silver nitrate, while No. 1 was a crude refiner's salt, acid, and roughly prepared, containing sodium and potassium salts; and No. 3 contained nearly 14 per cent. of nitrate of barium.

Assuming pure nitrate to be worth four shillings per ounce, the following, within a fraction, would be the relative values of the samples above—

1	2	3	4
3s. 3d.	4s.	3s. 5½d.	4s.

It is needless, however, to point out that the selling prices of 1 and 3 were much in excess of the relative values as compared with 2 and 4.

There is, however, a class of bodies in which the presence of foreign matter cannot be considered as an adulteration in the same sense as the addition of foreign salts to silver nitrate is one. Such bodies are those that are necessarily obtained at first in a very diluted state, and require expenditure of force in some shape to concentrate or purify them.

Sulphuric acid is an example of such a body; every per cent. of water removed from it represents so much coal consumed, and hence the price necessarily increases at a higher ratio than the increase of purity; and concentrated oil of vitriol would therefore scarcely be produced except that its diminished bulk compensates by a saving in carriage for the increased cost of production.

This is so well recognised that, where vitriol is required in large quantities, it is invariably made on the spot, and used, wherever possible, without concentration. Another class of bodies in which increased purity often means increased cost, is that in which substances are obtained by a change of conversion of other bodies; such a case is that of pyrogallic acid.

It by no means follows that a weaker sample has been wilfully adulterated; still, for economy and accuracy of work, it is highly necessary that the acid should be valued.

The writer has found the following method of valuation answer well, and therefore lays it before the readers of the Photographic News. Since it depends on the action of the pyrogallic acid on bromide of silver, it directly represents the value of the sample under examination for photographic purposes. Some bromide of silver is prepared and dried, and about one gram is introduced into a small flask with a few cubic centimetres of distilled water; 0·1 gram of the pyrogallic acid is then accurately weighed out and added to the bromide of silver and water; five or six drops of a solution of pure caustic soda are then added, and the alkaline solution is allowed to act on the bromide for a given time—say, ten minutes. This matter of time is of the utmost importance, and, having once been decided on, should be invariably adhered to, or the results obtained with different samples will not be comparable.

At the end of the time fixed on the alkaline solution is carefully poured off, and the bromide, now partially reduced, is washed with distilled water until free from sodium bromide. This can be rapidly and easily performed by decantation.

A small quantity of pure dilute nitric acid is now poured into the flask and gently heated. The reduced silver is rapidly dissolved, and the solution of nitrate of silver, with excess of nitric acid, poured off into a stoppered bottle; the bromide left unacted on is washed, and the washings added. The silver can now be estimated with standard sodium chloride, as long ago described by Gay Lussac, or the chloride may be precipitated and weighed.

If the volumetric method be used, the number of c. c. of solution required will give an arbitrary scale of value, but it is, of course, better to calculate from the amount of silver found in solution the amount of bromide reduced.

The writer recently obtained the following results with four samples of pyrogallic acid:—

Bromide of silver reduced in ten minutes by one part of pyrogallic acid—

1	2	3	4
3·35	3·67	2·68	2·66

Relative values—

1	2	3	4
1s. 10d.	2s.	1s. 6d.	1s. 5d.

The above will show the necessity not only for accurate work, but for economy of correctly valuing pyrogallic acid.

The Topic for next week will be "Carbon Pictures on Opal," by Mr. J. R. Sawyer.

Correspondence.

EXHIBITION OF PICTORIAL PHOTOGRAPHS.

Sir,—Will you allow me to state, in reply to a letter in last week's News, that the results of the monthly artistic competition in photography are exhibited at each meeting of the Society.

The Committee will, no doubt, in due time consider the exhibiting of the whole series at the end of the year; in the meantime the best way for "A Dry-plate Learner," or any one else who wishes to see the pictures, would be for them to join the Society.—Yours, &c.,

H. Garrett Cocking,
Secretary, South London Photographic Society.

THE ARCTIC PHOTOGRAPHS.

Dear Sir,—In the News for February 13, I notice a paragraph in which it is said that during the recent Dutch Arctic Expedition I used wet collodion plates on land, and collodion emulsion at sea.

Will you kindly allow me to correct this statement? During the cruise of 1878, I used wet collodion when practicable, but nearly always the Liverpool dry plates; while, during the cruise of 1879, I worked solely with gelatine plates prepared by the Liverpool Dry Plate Company.

I took some collodio-bromide plates in case of accidents, but only exposed two of them.—Yours very truly,

February 18. W. J. A. Grant.

CONVEX AND CONCAVE MIRRORS.

Dear Sir,—Would you or any of your correspondents kindly inform me, through the News, of the names of makers of convex and concave (silvered glass) mirrors, up to (say) two or three feet in diameter?

Also, what is the best way of cleaning spoilt dry plates, so that they may again be utilized?—I am, dear sir, yours faithfully, W. T. Jackson.

PHOTOGRAPHERS' SPECIMENS.

Sir,—I wish to call your attention to the very aggravated way in which assistants, &c., are deceived by petty photographers, &c. When they see an assistant advertising, they generally send for *specimens*, and these they generally forget to return, especially if good ones.

Hoping you will find space for this in your valuable paper, An Assistant.

PHOTOGRAPHY IN BED-ROOMS.

Sir,—Your correspondent "Yalnif" is a little too severe respecting my remarks on the above subject. In his letter to the News of 30th (not 10th) he asks Mr. Parkinson to give some directions how to proceed in taking portraits in sitting rooms; therefore I hoped, quite as much as "Yalnif," that Mr. Parkinson would have done so. As, however, such is not the case, perhaps you will kindly allow me sufficient space to give "Yalnif" my *modus operandi*, fully expecting my brother amateurs will silently laugh at my innocent simplicity. Having been asked by a portrait painter to oblige by taking a photograph of a child in a bed-room, I at first refused, saying I had never attempted such a thing before, and was very doubtful as to the resulting picture. However, by gentle persuasion, he induced me to try. I started at once, and found the room very small, with only one window about four feet by five. Imagine my nerves—how they trembled at the idea of securing a negative of a child about three years of age with so small an amount of light! I had read of many wonderful pictures taken on gelatine plates, more especially the University Boat-race, and I resolved to test their capabilities. The child was placed about three feet from the window on an easy chair covered with some light material. All being in readiness, I uncapped the lens, counted five seconds, then the child moved, and of course I recapped the lens at once, hoping to be able to expose longer next time, but was terribly disappointed, as the child moved at the third second. One more trial, but this time the little—what shall I say?—laughed the moment I uncapped the lens. Having only three plates (Wratten's) and all exposed, I packed up, feeling very angry with myself for having undertaken such a hopeless task, and started off home, the painter intimating that he would call next morning to see how they turned out. After business was over for the day I reluctantly repaired to my dark-room and commenced developing as per Wratten's instructions, but with a very forlorn hope as to the results. Imagine my surprise to find I had secured a very good, but slightly underexposed negative, a print from which I shall be pleased to send "Yalnif," together with any

further information he may desire if he choose to apply for same. My advice to all who are commencing the photographic art is to remember the old nursery rhyme:

"If at first you don't succeed,
Try, try, and try again."

Rellim Mij.

HOW TO PHOTOGRAPH BY GASLIGHT.

Dear Sir,—I want to take a good photograph by common gas-burners. As I have wasted over a dozen plates with no result, I should be greatly indebted to any of your correspondents who will kindly inform me how I may proceed successfully.—Yours obediently, F. R.

Proceedings of Societies.

Edinburgh Photographic Society.

This Society held its second Popular Meeting in Queen Street Hall, on the 18th ult. The President of the Society (Mr. Lessels) occupied the chair, and, in a short speech, introduced the lecturer, Mr. W. H. Davies, whose subject was entitled "Photographs from the Works of Living Artists" (in our next).

After the pictures had been exhibited, a vote of thanks was moved by Mr. M. G. Dobie, and carried by acclamation.

Glasgow Photographic Association.

A meeting of the above Association was held in Mr. Robertson's studio, Glassford Street, on Thursday evening, the 5th inst.,—Mr. J. J. Long, President, in the chair.

The minutes of the last meeting having been read and confirmed, the following gentlemen were then duly elected members:—Messrs. Horatio Paterson (Glasgow), W. Rodgers (Stirling), and W. J. Hogg (Glasgow).

Mr. Tannahill read a paper "On the Conversion of Old Silver Negative Baths into Printing Baths."

Mr. J. Urie (Dundee) exhibited an apparatus for taking pictures by gaslight; he described it as so arranged on castors that it may be wheeled to any part of the studio or right round the sitter, and any view of him may be taken. The principal reflector is the old oval concave reflector, five feet long by three feet wide, balanced on an iron stand made of one and a-half inch gas pipe, with sliding rods to work similarly to a head-rest, to elevate or lower the reflector for standing or sitting figures. By an arrangement the reflector can be thrown forward at the top or bottom, so as to angle the direction of the rays of light. The gas burner is made by bending four pieces of half-inch gas pipe into rings so that each may easily go into the circle of the other, the outer ring being about nine inches diameter, each ring being attached to an inch supply pipe. Into these rings are drilled as many holes as will admit about one hundred burners, and to each ring or set of rings may be attached a stopcock, and the whole may be used, or only part of the supply, for focussing. This burner is swung upon a rod the ends of which rest on notched horizontal slits made in the sides of the reflector, so that when the reflector is tilted the light may be brought into its optical focus. By this arrangement the burner keeps its perpendicular or upright position. Over the burner is placed a glass funnel 20 in. high and 12 in. diameter. On the top of this funnel is an iron pipe with a damper to regulate the draught, and partly to support the glass tube, which it fits. On to this, again, is attached a rod coming up from the stand to steady all, and on the roof is hung an ordinary shop-window reflector connected to a chain and worked with pulleys, so that it may be lowered or swung to any side. By this means the shadows are taken out of the background, and the light modified as required. The whole is fitted with india-rubber tubing, so that the apparatus can be moved to any part of the studio.

Photographic Club.

At the usual weekly meeting, held on Wednesday, the 18th inst., Mr. Henderson exhibited an adaptation of Richardson's spray diffuser, for use in making gelatine emulsions, and explained his method of using the same. A solution of bromide of silver was placed in a graduated bottle, and the pipe of the diffuser inserted through the cork; the required quantity of this solution was then "pumped" into the dissolved gelatine. He claimed, and also showed by experiment, that the bromide of silver was thus forced into the gelatine solution in an exceedingly fine spray, and thus became more intimately mixed with it than could possibly be done by any other method yet adopted. He also exhibited an ingenious adaptation of Clarke's Infant Food Warmer, for the keeping of gelatine emulsion hot, and also as a pourer for coating plates.

At the same meeting Mr Warnerke exhibited some phosphorescent powders which emitted coloured rays, some of which were very brilliant, the violet one especially.

Photographic Society of Ireland.

The usual meeting was held at the Royal College of Science, on Friday, the 13th inst.; Mr. Thomas Mayne, T.C., in the chair.

The minutes of the previous meeting having been read and confirmed,

Mr. Howard Grubbe, F.R.A.S., read a paper on actinometers, giving a *resume* of the various endeavours which have been made to supply photographers with a suitable photometer. He pointed out what such an instrument, to be successful, should be able to do, and showed where existing photometers fell short of what was really wanted, and were, therefore, of comparative value only. The principal reason of this was that they measured the light surrounding the instrument, and not the light reflected from the subject being taken. It was also considered that the estimate by the actinometer ought to be simultaneous with the exposure of the plate, as it is fully admitted that the light is frequently of a constantly varying intensity. An animated discussion followed the reading of Mr. Grubb's paper, the general tone of which was that we have still to look for a really practical actinometer.

Mr. J. V. Robinson brought before the meeting some novel properties of phosphorescent light, which further investigation might show to be of importance. He found that a surface prepared with one of the phosphorescent paints, if exposed to light in parts only, and then placed in contact with a dry plate, and after an exposure of five seconds with ordinary development, the plate rendered the image of the exposed portion of the card; further, he found that if the card were placed in a camera in the place of an ordinary plate, after the exposure a luminous impression was obtained, which by simple contact with the usual photographic substances would produce a picture.

The subject was considered so novel that it was hoped further experiments would be made by Mr. Robinson.

The meeting then adjourned to Friday, the 12th of March.

Proposed Photographic Association for Dundee.

A meeting was held on Thursday, the 19th, in the Masonic Hall, Meadows Street, Mr. Jas. C. Cox in the chair, for the purpose of forming an Association for the advancement of photography in the East of Scotland. There was a large attendance of the principal photographers from Dundee and district.

The Chairman, in opening the meeting, said it gave him great pleasure to see so much interest taken in the proposed Society; he had no doubt that if properly started it would do much for the advancement of the art.

Mr. S. F. Rogers spoke as to the good that might be derived not only to the photographic profession, but to amateur artists and chemists, were such a thing in existence in this part of the country, and also asked pardon for the liberty a few members had taken in sending out circulars calling a meeting.

Mr. J. Urie, jun., Secretary *pro tem.*, read several letters from gentlemen all wishing to become members were such a Society formed, and said he had the names of a few more who were unable to be present at this meeting.

Mr. W. S. Tannahill proposed that a Society be formed for the three shires—Fifeshire, Forfarshire, and Perthshire—the meetings to be held in Dundee.

Mr. S. F. Rogers seconded the motion, which was carried unanimously. A Committee was then appointed of Messrs. John Urie, W. S. Tannahill, S. F. Rogers, A. Robertson, C. Johnston, and H. Fraser, to draw up rules, and submit them to the next general meeting to be held on the 4th of March in the same Hall. A hearty vote of thanks to the Chairman terminated the meeting.

Photographic Society of Vienna.

At the meeting of the 2nd December, 1879, the President, Dr. E. Hornig, informed the Society that he had received an invitation from the Industrial Association of Lower Austria to take part in their proposed Exhibition, which it was intended to hold in the Rotundo from the 15th July to the 15th October, 1880. He wished to have the opinion of the members present on the advisability of the Society's being represented at this Exhibition in its corporate capacity. No one, however, being prepared to discuss the subject at the moment, the question was referred for decision to the Executive Council of the Society.

The Secretary, Herr F. Luckhardt, reported that the Executive Council of the Society had determined to reopen the prize competition for the current year. In 1879 the list of prizes (see Photographic News for the 4th of April, 1879, page 161) had failed in attracting a sufficient number of competitors; the prize list would again be published for 1880, but previously to doing so the executive Council were anxious to learn the views of the members on the different subjects for which competition was invited.

Herr Jaffe maintained that, with the number of prizes which were at the present day offered for competition in every direction, the Voigtländer medal alone was not of sufficient value to attract competitors of high standing; he recommended the addition of a money prize. He objected to prizes being offered simultaneously for the best dry process and for researches on the emulsion processes. He further observed that a prize of 1,200 marks in gold was hardly sufficient to induce the inventor of a sure and simple method for producing plates in high and low relief, expressing the half-tones, to make that method public. The speaker also alluded to the grand prize for investigations of pyroxyline and collodion, and pointed out that such a prize might well be offered by a scientific association, but scarcely by a photographic society, as the only person who could derive benefit from such investigations was one possessing chemical knowledge, and one who was in the habit of preparing his own raw collodion and pyroxyline. Similar remarks would apply to the prize for the discovery of the theory of the negative process. Finally, Herr Jaffe urged that a prize should be offered for a really good manual of the collotype process, as those already published by Husnik and Schnauss did not meet the wants of the learner.

Dr. Husnik returned the thanks of the meeting to Herr Jaffe for the remarks he had made, and assured him that his views, as well as those of the other members of the Society who had expressed them in writing, would be laid before the Executive Council. He thought it, however, his duty to submit to the meeting the reason why the Council had again offered the same prizes as last year. The prize for the best dry process had again been offered, on the principle that the invention of a collodion process would not be excluded, nor of any other dry process which could compete with the gelatine process as regards sensitiveness, and at the same time evade some of its inconveniences. As regards the prize for researches on gelatine emulsions, the speaker observed that the subject had been often mentioned, both at the meetings, and in the official Journal of the Society, without inducing any one except Herr Haack to investigate it. To the objection to the grand prize for a monograph on pyroxylin and collodion, Dr. Husnik replied that, as an attentive reading of the programme would show, the Council required to have a practical solution of the many difficulties which presented themselves to one studying the subject, rather than a scientific dissertation. With regard to the remarks of Herr Jaffe on the prize for the half-tone printing plates, the speaker could assure him that similar objections had presented themselves to the Council; they had hoped, however, that some amateur, blessed with a fair share of this world's goods, might be induced to compete, rather for the honour than for the money-worth of the prize. The Voigtlander gold medal, however, had a real money value, inasmuch as it was struck in pure standard gold.

Dr. J. M. Eder then proceeded to demonstrate, with the aid of one of Browning's spectroscopes, the value of different kinds of glass as protection against the access of actinic light to the dark room. He also exhibited the representations of the spectra obtained by Dr. Vogel from Geissler's tubes, which that gentleman had sent to him, together with a highly interesting paper on the subject from Berlin, and took the opportunity of pointing out the greater clearness of photographs of these subjects taken on tissue paper, over the collotypes which accompanied the paper.

The same speaker also gave an abstract of a report on the investigations undertaken by him in conjunction with Capt. Toth on collodio-bromide emulsions obtained from Herr Liesegang in Dusseldorf, Herr Wilde in Gorlitz, and Messrs. Stebbing and Rossignol, of Paris. In this report, the authors point out that the collodion emulsions are in point of sensitiveness far behind those of gelatine. They believe, however, the subject of the behaviour of collodion with the silver compounds to be well worth further investigation, as the preparation of plates with collodion emulsion is much more convenient than that with gelatine emulsion.

In conclusion, Dr. Eder exhibited a specimen of crystallized potassium oxalate, which he used for the preparation of ferrous-oxalate developer so strongly recommended by himself. This salt was now produced wholesale in a state of great purity by Dr. Schuchardt, proprietor of the chemical works at Gorlitz, and in consideration of the expected great consumption for photographic purposes, its price had been reduced 50 per cent.

Photographic Society of France.

M. Davanne, President of the executive Council, occupied the chair at the general meeting of the Society on the 9th of January last.

M. Perrot de Chaumeux was called on to read the usual selections from the home and foreign journals. Among them he gave an account of the method adopted by M. Baldus to produce his well-known magnificent prints. The paper, very carefully picked out, is first put to float for from six to ten minutes on the following bath kept hot on a water bath :—

Distilled water	500 parts
White gelatine	10 „
Potassium iodide...	5 „

and to this are added 25 parts of the aceto-nitrate solution of which the formula is given below. This liquid assumes a yellow tint in consequence of the formation of silver iodide. The paper is then dried, and afterwards plunged into a one per cent. bath of potassium iodide, after which it is again dried, and finally sensitized by immersion in the following solution :—

Distilled water	100 parts
Silver nitrate	6 „
Glacial acetic acid	12 „

Washing, drying, exposure in the camera, development by gallic acid, and fixing, complete the operation as in the ordinary method.

M. Quinsac, of Toulouse, gives a means of preventing in the gelatine process spots from forming in the places where the gelatine seems to refuse to moisten the glass. He puts the emulsion, when dissolved, to stand over the water bath, and skims off the scum which forms on the surface of the vessel containing it. A pipette may also be used for taking up the gelatino-bromide below the film. In this way those spots which in development give rise to transparent patches may be avoided.

M. Fabre, of Toulouse, submits the following formula for a developer as giving excellent results in the wet process :—

A.—Ammonio-sulphate of iron ..	7 grammes
Water	50 „
B.—Green sulphate of uranium ..	2 „
Water	50 „
Sulphuric acid	1 drop.

The two solutions are mixed and digested for twenty-four hours with some strips of iron ore. At the end of this time are added 0·5 gramme of copper acetate, 3 cub. centim. of alcohol, and from 1 to 3 cub. centim. of glacial acetic acid, according to the state of the silver bath. The greatest rapidity is attained when the bath is slightly acid, and the proportion of acetic acid 1 per cent. of the developer.

M. A. Colas submitted to the Society some of his prints with salts of iron, reproducing the drawing in black lines on a white ground. He takes advantage of the property of perchloride of iron to become reduced under the action of light. A paper is sensitized with the salt, and exposed behind a drawing on semi-transparent tracing paper. The print is then developed in a bath of gallic acid, and the reproduction is obtained in real ferric gallate, which is the foundation of common writing ink. M. Colas recommends this method for reproducing plans and tracings, and all kinds of line drawings. Some of these are

necessarily very large; he has, therefore, also designed a support or a frame of the required large dimensions for printing, which of course is heavy and difficult to manipulate. The printing frame is hung on an iron stand by means of two pivots, so that it can be turned round and exposed to the light at any angle. Between the legs of the stand is fixed the dish containing the developing liquid. The frame can also be swung so as to assume a horizontal position, and can be fixed there by means of an iron pin, with the glass side downwards. In this position it can be used as a drawing table. The whole is mounted on castors, so that the stand can with ease be moved about from one part of the studio to another.

Talk in the Studio.

South London Photographic Society.—The next meeting of this Society will take place on Thursday next, March 4th, at 8 p.m., in the Rooms of the Society of Arts, Adelphi, when papers will be read by Mr. E. Dunmore on "What is an Artistic Photograph?" and by Mr. F. J. Pearsall, F.C.S., on "Colours Applied to Photography."

Proposed New Society.—As will be seen by a short report on another page, there appears to be good prospect of the formation of a society for the advancement of photography in the East of Scotland.

Mr. Bassano's Gallery.—Mr. Bassano has had the honour of submitting to the Queen's inspection the busts of the Duke of Connaught and of the late Prince Imperial.—*The Times.*

Technological Examination of the City Guilds for 1880.—The following is the Syllabus from which the Examination Papers will be set, the examiner being Captain Abney, R.E., F.R.S.:—I. The examination will include questions founded on such subjects as the following, but will not necessarily be confined to these subjects:—1. The characteristic properties of pyroxyline for the manufacture of collodion, and the various substances employed for the purpose, as well as the solvents, such as ether, alcohol, wood naphtha, &c. Different qualities of collodion. 2. The various processes, both wet and dry, including the Daguerreotype; and the principles involved in each. Emulsions, both with collodion and gelatine, paper processes, developers, acid and alkaline, intensifiers, &c. 3. Processes for portrait work, landscape work, copying pictures, maps, engravings, and documents of all kinds. Printing in silver, and other metals, in carbon, Woodburytype, vitrified enamels; toning and fixing. 4. Special applications of photography to engraving, typography, photo-lithography, including the various processes for collotype, &c. 5. Special applications of photography to astronomical and microscopical purposes, as well as for recording meteorological and other observations. 6. Lenses and the various purposes for which they are specially adapted. The construction of cameras, and other apparatus, &c. II. For the full technological certificate, the candidate will be required to have passed at least in the elementary stage of one of the following science subjects:—8. Acoustics, light, and heat. 10. Inorganic chemistry. 11. Organic chemistry.

Shadow Pictures.—A correspondent sends us a cutting from the *Eastern Star*, a Graham's Town paper, received by the last mail, remarking that the fact mentioned is very curious, and that its insertion in the Photographic News may lead to its being explained, if explanation be possible:—"Here is a fact for the curious and scientific to speculate upon. About a month since, an opera glass was lost on the farm of Mr. W. Lanham, near Highlands. It was found again a day or two since. The face of the object lens of each glass was then found to bear an impression of reflections such as could be seen in them, as the glass stood up on its smallest ends, on a bright starlight night. The stars in the heavens are plainly visible still upon it, as also are such shadows of leaves and branches of trees as would fall upon each lens, the picture in each being somewhat different. These shadow pictures have the appearance of being ground into the glass, and they are immovable, every effort to remove them from the lens having failed. By what process of nature could these reflections or shadow pictures have been engraved upon the lenses of this opera glass, during the month it stood upon end in the wilds of 'Stoneham' farm, we leave to others to solve. The facts as stated are undeniable, the glasses having been examined to-day by many persons."

To Correspondents.

Edwin Crook.—*Moniteur de la Photographie* and *Bulletin de la Societe Francaise de la Photographie; Philadelphia Photographer* and *Anthony's Bulletin.* We will get you the addresses. Thanks for kind expressions.

J. F. Edisbury.—Mr. Edwards's address is 6, The Grove, Hackney.

John Urie.—Thank you.

A. S. Hale.—We find the formula comes from the *Moniteur*, and grammes would therefore be right; you might be sure a French journal would not give the quantity in grains.

A. Borland.—A trace of nitrate of lead would not act as you suppose. If you want a dense film—as black as your hat—then you may use a lead intensifier, such as Eder and Toth's, which gives a very opaque film (see Year-Book for 1877 or 1878). Photo-lithographers often prefer this lead intensifier to the bichloride of mercury.

J. S.—The Venus of Milo may still be seen at the Louvre; we saw it ourselves not two years ago on the ground floor. It stands at the end of a corridor, and may be seen a long way off. It was not injured, apparently, then, although it is said to have a bad fracture. Photographs of it are to be purchased at a reasonable rate. It was discovered on the island of Milo, hence its name.

W. Brookman.—Retouching with the pencil cannot be learnt by book; you must practise, and acquire proficiency in that way. Yes, there are many German assistants who excel in it in this country. No doubt it is trying to the eyes, but so are other occupations.

Gordon.—Thank you for your "Note," which you will find inserted.

Retoucher.—Rub a little fine soot over it with your finger; it is the best method we know. But mind and avoid grit.

J. Jameson.—1. Not necessarily. 2. See what we say this week about stains on gelatine negatives. 3. Gulls, swallows, and canards: we put them all in the same category.

R. T.—Ask the Autotype Company.

Makeshift.—Turpentine applied to the negative will do it, but you must have a harder pencil for gelatine films. See our "At Home" this week.

R. T. and Co.—Thank you for the suggestion, which we doubt not is made in our interest, but we prefer to make our own selection. We cannot say; it will depend upon circumstances. We have a plan of our own, and intend to follow it.

L. L.—Tone with iridium and gold. See answers of the week before last.

Lieut.-Col.—Russell Manners Gordon is the name usually connected with the gum process; we believe he is in England. Send us a letter, and we can no doubt forward it.

J. B.—You express a long-felt want. Mr. Hughes is the author of a little book which, no doubt, you can obtain at Mr. Werge's establishment (see our advertising columns). But you ought to study inorganic chemistry generally, if you desire to be well grounded. Fownes' Chemistry is a very good handbook, and if you seriously want chemical knowledge is, perhaps, the best for the purpose.

Transparency Tissue.—Since what you conclude from our description is perfectly right, we naturally congratulate ourselves upon having led you to understand right. The collodion may be applied to tissue like coating a plate, and it matters little whether it is perfectly dry when put into cold water. You *must* rinse in cold water, since the printed tissue prior to development has to be soaked. A practical experiment or two would show you a great deal.

F. R.—We said good *under the circumstances* (see another column on this subject). Very much has yet to be done; but we are steadily progressing.

W. W. Winter.—None has been published within the last few years, and gelatine has entirely upset old notions. Captain Abney's Handbook, which our publishers could supply, might suit you; by post, 2s. 9d. Our columns for past year, and Year-Book for 1880, gave plenty of information about gelatine dry plates.

W. Salman.—We cannot answer your question, neither, do we think, could any one else. The studios we have recently visited had none of them anything noteworthy about the angle of glass roof. A midsummer sun at noonday would be directly overhead, and could not be avoided by a roof of any angle; but a suitable screen is easily made.

H. Blanchard.—If you will send us a permission from the Inland Revenue, we will gladly give you a recipe.

Several correspondents in our next.

The Photographic News, March 5, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photographic Copyright—Photographs as Legal Evidence—Spence's Metal or Gelatine Moulds—Trying it on.

Photographic Copyright.—The vexed question of copyright is still as far off being settled as ever. It was hoped that the Copyright Amendment Bill introduced by Lord John Manners, Viscount Sandon, and the Attorney-General in July last, would have come on for discussion this session, but it has been sacrificed to the Juggernaut of Obstruction, and the subject will be left for a future Parliament to deal with. So far as photographers are concerned, the present Bill may be said simply to make legal that which has been pretty generally the practice in the profession. The clauses relating to photographs are brief, and it may be useful to reproduce them *in extenso*. (*a*). The provisions of this Act, as to the name of the author and date of execution, shall not apply. (*b*). The copyright in a photograph shall endure for thirty years from the date of the publication of the photograph, and no longer. (*c*). The copyright in a photograph shall belong to the proprietor of the negative from which the photograph is printed. (*d*). When the photograph has been made on the order of any person for a valuable consideration, the proprietor of a copyright shall not be entitled to sell, expose for sale, or exhibit any copy of the photograph without the consent of the person, and that person shall have the same right of preventing the selling, exposing for sale, or exhibition of any copy of the photograph; and, if the copyright is infringed, of taking proceedings in respect of the infringement, as if he were the proprietor of the copyright. It is not quite easy to understand why, in this clause, the word "valuable" should have been introduced, as it is just as reasonable to ask that a negative for which one shilling has been paid should be protected, as if it had cost five guineas. Considering the word "valuable" by the light of its ordinary interpretation, it is certainly open for a man who has infringed the copyright of a negative (the consideration of which was, say, sixpence) to plead that the consideration was not a "valuable" one. It is possible a judge might not admit the plea, but, if not, he would in justice have to define where inferiority ends, and "value" begins. Though not expressly stated, this clause implies that when a person sits for his photograph the copyright in the negative belongs to the photographer, though the latter cannot make use of it in any way without the consent of the sitter. This, of course, is only right, and, as we have just pointed out, is but a confirmation of the rule generally acted upon. In a recent libel case, some remarks which, we believe, were unfounded and unjustifiable, were indulged in by a learned counsel, who asserted his client had made every effort to stop the sale of certain photographs, but without success. As far as shopkeepers are concerned this is quite possible, and the law at present provides no remedy; but in regard to the photographic profession, no photographer of respectability, we are certain, ever makes use of a negative in opposition to the wishes of his customers; indeed, most photographers are extremely punctilious on this point, and we know an instance where a photographer of eminence refused to supply an artist (though he knew the latter to be a friend of the sitter—a young lady, whose portrait the artist wished to introduce into a picture he was painting) with a photograph until he obtained the consent in writing of the father of the young lady. It is but just that the person photographed should have some right in regard to exhibition of the photograph, and that he should be able to exercise that right legally which he certainly cannot do at present. Supposing that you are abominably ugly, and the photographer exhibits your portrait; or put the case that you have offended him by objecting to the head-rest and by moving in consequence, and he takes his revenge by holding you up to public scorn in the possession of three heads, or with your nose amalgamated with your mouth—surely there ought to be a safeguard against all this! And yet, at present, there is none. Or take a possible contingency hinted at by a correspondent last week. You are an assistant in want of a situation, and you send specimens of your best work to a "petty photographer." You never hear anything more of your situation or your specimens, until one day you are upbraided by one of the originals, because you have allowed his or her photograph to be exhibited in a case of monstrosities somewhere in the New Cut! The subject of copyright in photographs is really one which might be fairly discussed by the various photographic societies before the Bill is again brought before the House of Commons.

Photographs as Legal Evidence.—Photography is destined to play a very important part in legal proceedings, especially in cases of accident, when the causes are disputed, and when it is essential an exact representation of the condition of affairs immediately after the accident should be laid before a jury. For this purpose photographs were taken of the scene of the disaster at Vauxhall, and these may probably be of assistance in fixing the liability on the proper parties. Such photographs, however, require to be executed with some degree of intelligence on the part of the photographer, and an appreciation of the facts of the case, or they may become absolutely misleading. Precise as the camera is, it would not be very difficult, we fancy, by the use of an unsuitable lens, and by the choice of an improper point of sight, to give an idea of the appearance of any place quite foreign from the truth so far as relative proportion is concerned. We remember a case some years ago when a photographer made a blunder of this kind, which proved very disastrous to his client. The latter was a publican who was very anxious to obtain a spirit licence for a large public house he had built. The chief opposition to his application came from a neighbouring Boniface who had had undisputed possession of the custom of the locality for some years, and who, of course, did not want an intruder. The applicant's house was situated on the top of a gentle slope at the corner of two roads, and was really an imposing looking edifice; the opponent's house was a somewhat stunted building also at the corner of two roads, but with a considerable frontage on one side. It occurred to the applicant that if he could only lay the photographs of the two houses before the visiting justices they would be so overcome with the contrast presented, that they would immediately grant him a licence. Accordingly he had the two photographed. Unfortunately the photographer used a short-focus wide-angle lens, and, selecting his point of sight in respect to the new house opposite the angle (which happened, unfortunately, to be naturally rather an acute one) formed by the two sides of the building, produced a picture in which the two lines of the roof formed almost an isosceles triangle, while the house was squeezed together in the most absurd fashion. The perspective, in fact, was strained and unnatural, and the camera had absolutely made a picture which no human eye (unless it posssssed a short-focus, wide-angle lens) could by any possibility see. To make the matter worse, instead of meting out the same justice to the old house, the photographer selected a point midway opposite the longest line of frontage, and planted the camera much nearer the object than he did in the first instance. The result was, that the old house in the photograph appeared much the more imposing of the two, and anyone who had not seen the originals would have preferred it to the ungainly and disproportioned edifice of which the owner was so proud. At any rate, the justices thought so, and refused the licence. There is no occasion to point out the moral of this little story. Every photographer who is accustomed to use his brains will see it for himself. The one who does not—— well, we fear there is no hope for *him*.

At Home.

MESSRS. WILLIAMS AND MAYLAND IN REGENT STREET.

Some years ago official business called us to Marlborough House. It was a cold foggy morning at the fag end of October, and the wide vestibule struck us as intensely chilly, on our entrance; moreover, on ascending the thick carpeted stairs, we were ushered into a room on the first floor in which the door was kept permanently open. It was the equerry's room, and that gentleman received us with exceeding courtesy. But he, too, was cold, and his faultless attire did not give one the impression that he derived any warmth from it. Our conversation was conducted in tones scarcely above a whisper, and there was a degree of unrest observable that was anything but comfortable. The open doorway commanded three corridors: the one by which we had ascended, that continuing past the equerry's door, and a third *en face* in the direction of the Prince's apartments. These corridors it seemed the equerry's especial duty to watch, and during the period of our visit that officer never took his cold eye off the doorway. Portly footmen in red coats, white stockings, and low shoes came and went without a sound, and startled you by their vivid appearance in the chill silence. Our companion was "family doctor" to the Princess of Wales, and by virtue of his position indulged occasionally in a little joke by way of thawing the frigidity that prevailed; but the equerry did not unbend, and even the brisk entrance of Prince Arthur—he was not Duke of Connaught then—who good humouredly exchanged half a dozen bright sentences, was without effect upon the stern official. But as we still waited and watched the corridor opposite, and His Royal Highness failed to appear, the equerry, knowing that the doctor and ourselves were conversant with photographic matters, mentioned the circumstance of some little enamels having just arrived for the Princess, and these he submitted for our inspection. They were medallions of the Royal children, and taken, he said, by a little firm in Regent Street, of which he did not quite remember the name, but he thought it was that of Messrs. Williams and Mayland.

Since that day Mr. Mayland has had the good fortune to win a medal for photographic enamels, the only award of the kind, we believe, given in this country. Like his late partner, Mr. T. R. Williams, he appears to confine himself to small work of exquisite softness and finish, and to trouble himself little about other phases of portraiture. A saunter round the reception-room of the "little firm in Regent Street" at once supplies the reason why Mr. Mayland receives such distinguished patronage. Her Royal Highness the Princess of Wales might well choose "the little firm" to execute her work, for in enamels and the portraiture of children evidently lie Mr. Mayland's strong points. Here is an infant Hercules, bold and defiant; here, two tiny children, muffled up against the cold, standing opposite one another; you can almost see their breathing in the cold air, and they seem to have served as models for Kate Greenaway, whose pictures have been so popular this winter. They wear little coal-scuttle bonnets, and quaint cloaks of fur, and their chubby cheeks are aglow with health. Here is a lady in a garden hat, feeding a canary—a delicate cabinet picture this—and here are a row of military heroes, for once without any semblance of loudness and vulgarity. One reason, no doubt, for the general success of these pictures is the fact that Mr. Mayland, and Mr. Mayland alone, is the author of them; everytsitter, we are told, has his personal attention.

We go upstairs into the studio to see Mr. Mayland, ushered by a polite young lady, who harbours grave doubts, however, as to the policy of our visit. She scarcely holds with our notion of giving an account of what we see in the News; but consoles herself with the reflection, expressed naively enough in our presence, that "to be sure it does not matter much, for not one in ten will ever look at it." Mr. Mayland is busy with a sitter—a clown in motley. He is not a large clown; in fact, he is a very little one—a tiny scaramouche who has been present at some fancy ball, and whose mamma desires that he shall be perpetuated in Grimaldi attire. We ask Mr. Mayland not to mind us, and he does not.

We always thought photographers had an aversion to children; at least, half the woes of which disciples of the camera complain seem to take their rise from tender offspring. But to Mr. Mayland, such work seems to afford the greatest treat in the world. The way in which the little fellow is entreated, prayed, joked, cajoled and flattered, makes him eminently obedient. No wonder Mr. Mayland is one of the few photographers in London who seems entirely successful with children. He has in an eminent degree that rare combination of qualities—patience, perseverance, tact, and skill—combined with that delight in the work, which is necessary for managing juvenile humanity. In a word, he converts what to many little sitters is a trying ordeal into a merry game that they thoroughly enjoy.

The glass-room of the "little firm in Regent Street" can scarcely be regarded as a model, and, therefore, it need not be described in detail. In fact, to many photographers, it would be a wonder how such softly rounded features, such delicate modelling, and rare finish could be here secured of this perfect manner in a studio which has no side light, but one directly facing the sitter, and this of a westerly nature. Fortunately there is an ample supply of illumination—indeed, the studio was built for Daguerreotype work, when light, and plenty of it, was the only consideration—so that a good deal may be done with curtains and screens, but it is only between the hours of 10 and 12.30 that Mr. Mayland can work with effect. The studio has a length of thirty-three feet; the skirting board facing the sitter rises some three or four feet, and then after a few feet of window there comes the sloping roof glass.

To shade his cameras, Mr. Mayland was formerly in the habit of employing a canopy overhead, but this, by reason of his defective lighting, he was compelled to abandon; he now uses but two tiny laths which project in an upward direction beyond the lens some eighteen inches, and over which a piece of black velvet is spread. With a view to amuse children, there are plenty of quaint pictures of the Reinecke Fuchs order on the walls, while another marked feature is a round disk of chamois leather with a bleeding heart in the centre; fortunately before we had taken a sketch of the latter to present to our readers, as a novelty for attracting the sitter's attention, we were informed that it had no photographic value at all, but was there simply for the purpose of practising with the foil, for Mr. Mayland, it seems, is a skilled fencer.

Mr. Mayland was good enough to develop some gelatine plates in our presence. He employs for the purpose only artificial light. He has had a lamp expressly made, which is of metal on all sides except the face. This has a drop front of ruby textile fabric, purchased of Mr. Thomas, of Pall Mall. The lamp measures about twelve or fourteen inches in height, and has a gas burner, which is always kept low. He develops, after the sitters have left, the whole batch of negatives taken during the day. He cuts his double plates into halves with a diamond; immerses the first in the developer, and acts upon the second with a weaker or stronger solution, as the first seemed to indicate. The development of the first plate is quite sufficient for all the rest. To ascertain whether a gelatine film is perfectly clear—for it should not have the slightest tinge of brown—it is placed upon a sheet of white paper. The brown tinge is evidence, not that the solution was not strong enough, but that there was too little of it.

With plenty of developer over the negative, no browning of its transparent portions will ensue; and how detrimental to the printing qualities of a negative this brown tint is, need not be stated. For retouching, he employs, before using his pencils, a little of the "autotype medium," which answers very satisfactorily in his hands. The negative is moistened with this "medium" by means of a bit of rag, and in five minutes is as good as paper for pencilling upon. B or HB pencils are used, and if the retouching does not please, it is easily removed again by the "medium." When the negative has been satisfactorily retouched, it is varnished. Mr. Mayland has not employed a wet plate throughout the winter in his studio, and he estimates the comparative sensitiveness of his gelatine films at about eight times that of collodion.

Mr. Mayland was good enough to show us his laboratory for the preparing of enamels, and the muffle furnace he employs in his work. The process is of so delicate a nature that he can trust it in no other hands than his own, but he was good enough to say he would be "at home" to us any day we might mention, to have an opportunity of witnessing the operation throughout.

To those interested, we may mention that the charges made by the "little firm in Regent Street" are respectively a guinea and a guinea-and-a-half, the former entitling the sitter to twelve carte portraits, and the latter to eight cabinets. The charge made for enamels is from £2 2s.

Our next "At Home" will be "Mr. Baden Pritchard at the Royal Arsenal, Woolwich."

ON THE PHOTOGRAPHIC SPECTRA OF STARS.

BY WILLIAM HUGGINS, D.C.L., LL.D., F.R.S.*

In this map (fig. 3) you have laid down, by comparison with M. Cornu's map of the ultra-violet part of the solar spectrum, some of the photographic spectra which I have obtained.

Early observations which I made of the visible spectra of the stars showed that the stars which shine with white light have the lines due to hydrogen at *C*, *F*, and near *G* very strong, while the metallic lines are comparatively feeble. The first five spectra in the map belong to stars of this class. I have placed first the spectrum of Vega, which it will be found convenient to regard as typical of the whole class. It consists essentially of twelve strong lines (see also fig. 4). The first of these coincides with a line of hydrogen near *G*, the second with solar *h*, also due to hydrogen. The third line coincides with *H*. At the position of *K* there is no strong line, only an exceedingly thin line. Now *H* and *K* are usually attributed to the vapour of calcium. It was, therefore, important to see if any of the more refrangible of the star lines coincide with a pair of strong lines of calcium more refrangible than *H*. They do not. There is a line of hydrogen coincident with *H*. If this group be completed by the two strong lines in the visible spectrum, *C* and *F*, then there are five of them which belong to hydrogen. Further, if we plot them down according to their reciprocals of their wave lengths, the fourteen lines are found very nearly indeed in a definite curve: a state of things which suggests that they are all members of a common physical system. In the photograph the continuous spectrum does not end with this group of lines, but continues strong far beyond *S*, but no other lines are seen in this star.

The other four stars of this group I have laid down in the order of modification or departure from this typical spectrum. These changes take place in three directions: In the thickness and more or less diffuseness of the edges of the twelve typical lines; in the presence or absence, and

* Continued from page 100.

STELLA SPECTRA IN THE VIOLET AND ULTRA-VIOLET REGIONS, Measured from Photographs, and compared with the Solar Spectrum.

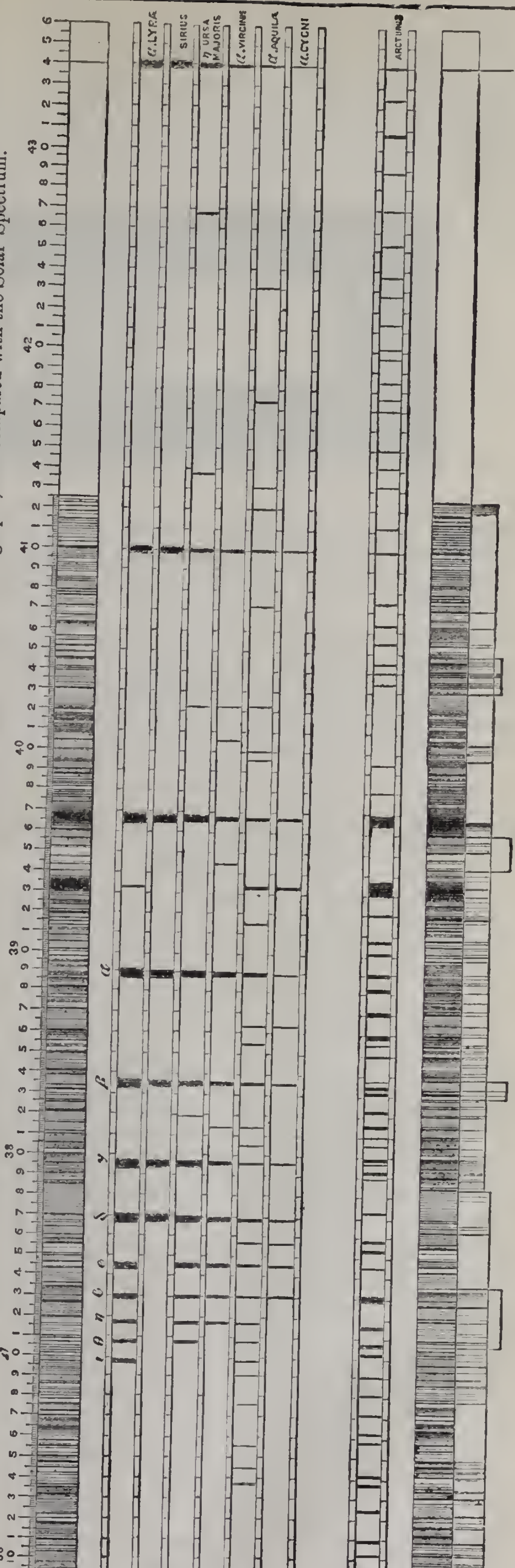

Fig. 3.

if present, in the relative thickness of K to H; and thirdly, in the number and distinctness of other lines in the spectrum.

In the last spectrum, that of Arcturus, which shines with an orange light, the line K is stronger relatively to H, than it is in the solar spectrum. This circumstance, together with the other features of the spectrum, suggest we have to do with a spectrum further removed in the order of change from Vega than is the solar spectrum. May we not in these changes also see some of the life-changes through which the stars pass? Was there a time when the solar spectrum presented the simple form we still see in Vega?

I have also obtained photographic spectra of the planets Venus, Jupiter, and Mars, taken while there was sufficient light from the sky to form also a spectrum on the plate. In this way it was possible to compare directly the planetary spectrum with that of the sun under precisely similar conditions of terrestrial atmosphere. In the part of their spectra contained in the photographs, namely, from G to O, no modifications of the solar spectrum are found which can be referred to an action of the atmosphere of the planet.

Fig. 4.

The spectra of very small areas of the moon were taken under different conditions of illumination, but they are negative as to existence of a lunar atmosphere.

I hope shortly to be able to apply the photographic method in several new directions in connection with the physics of the heavenly bodies.

PHOTOGRAPHS FROM THE WORKS OF LIVING ARTISTS.

BY W. H. DAVIES.*

Artists, of whatever profession, are by their nature a sensitive race; whether they may be poets, authors, or actors, painters, sculptors or musicians—all are desirous of public recognition and public appreciation, and necessarily they must submit to public criticism in order that they may be appraised at their proper worth. It is rare that men of their class are appraised at their true value in their lifetime, so many accidents occur or concur in preventing it; but in order to obtain this appraisement there must be publicity in one form or another. With the author it may occur in repeated demands for new editions of his works; the poet may have his words, and the musician his tones, made the household joys of half the world; but for the sculptor and the painter there is only the direct sight of the works produced, or copies of them in any one of the dozen methods employed to reproduce them, by which the necessary publicity can be attained. Your newspapers may convey the ideas of "Our Critic" or "Our Art Correspondent;" your favourite magazine or review discourses learnedly upon the esthetic qualities displayed by the limner or modeller; but no written description can convey what either of them wish to be conveyed.

In the plastic arts, sight is essential, whether for their creation or their enjoyment; and where this is rendered impossible by distance or other obstacles, there remain only the various methods of reproduction, and *this*, that the Council in its wisdom have adopted, is the second time such a thing has been done by the Society. We are able to show, through the kindness of the various artists whose works are to be exhibited this evening, transparencies from negatives taken direct from the pictures or pieces of sculpture.

Great artists may possibly feel that they require neither criticism nor help, but I take leave to point out that all modes of illustrating *good work* do *good work*; they bring before certain classes of the public that which they may never otherwise see or know of, and so they might pass through the world without that addition to their stores of the knowledge that is so easy to carry and so useful to have.

I need say little of the refining and humanizing qualities of all forms of art: it is not that which in a great measure civilizes all people, it is the first distinct evidence of a desire for improvement. From the very earliest of the prehistoric records which have come down to us—not by the usual forms of written communication, whether that partook of the character of symbols of arbitrary form, such as those we use for ordinary writing or printing, or of the monuments in builded stonework, or of the tools and weapons of the cave dwellers (who have had as yet no history and no historian), or of the hieroglyphic records of the Aztecs, Peruvians, and Mexicans as representing the civilized communities of the New World, and downwards, to their savage brethren of the wigwam, and the canoe—all have had one universal language, and that language has been the language of Art.

Picture-writing, it is called, and is, but it is not the less the outcome of the artistic and inventive mind, be it in saint or savage; and to that savage who first thought of, or rather could not do otherwise than prettily or practically shape and polish his stone or wood hatchet, or club, are we indebted for our first step up the ladder of civilization.

If the records of the Old World are looked at, the result of the examination is the same. The earliest and the latest of the Eastern peoples are alike in one thing—they are picture writers. Egypt has the oldest known civilization, has written her history in pictures, has carved in enduring stone the history of her national life. So with Assyria, so with all the early civilizations—the artist and his work, rude and crude though it may be, is invariably the agent employed in improving or civilizing his fellows; the instinct given to him compels him to work in the given direction, and that direction is invariably in the line of progress, and that progress must be an educative one.

It may happen that he himself is of an unimprovable disposition, but that does not alter his proposition, fact, or

* Read before the Edinburgh Photographic Society.

care. As in the early, so in the recent, has the work of the artist been made to do duty in interpreting through ideas and words; and that, too, by Her Britannic Majesty through one of her pro-consuls, Sir Robert Barkly, during one of the Maori wars. Knowing nothing of the Maori speech, and less of their written language, he had to apply to a native artist to write a pictured proclamation that all who ran or saw might read.

Thus we see that the artist—the former, the maker, the man who has one or more ideas, and can give them physical shapes, be that as a picture, or a jug, or a carved or modelled figure or group, or a noble building—does the world good service—creates, in fact, that which previously had only existence in the realms of his own far-reaching thought. There are, no doubt, in this direction many degrees of quality—as many, perhaps, as in that idea so lucidly expressed by Thomas Carlyle in his monograph on Robert Burns, "as much difference as there is in a voyage round the world and one to the Isle of Dogs;" but still it must be admitted, even by photographers, and those of the modern Athens, that the ideal, and the power to represent it, take precedence of the mere copying of the real, and it is here where the true artist—the man of imagination—has his own acknowledged field, and that one in which, by reason of its intrinsic difficulty, there are few or no competitors. I suppose it would not be difficult to count within the compass of one's ten fingers the really great painters this planet has given birth to; so, also, of the sculptors, so of the architect. I speak not of the other arts: they do not come within the scope of this evening's subject; but, as I said before, it is for the good of the world, for the benefit of civilization, and for the best interests of man, that the widest diffusion of the works of true artists should be encouraged, and acquaintance with their peculiarities and beauties be cultivated.

It cannot be expected that in our reproductions, taken, as they have been, at various times, and with no purpose of showing them in this way, that they will faithfully represent the works. Few photographs do that, for from the difficulties of colour, of surface, and other considerations, the photoscript is but an indifferent representation of the living force of the original; but in many, if not in most of those to be shown, colour feeling has, to a large extent, been retained, and thus, to some extent, you will have monochrome representations keeping the light and shade as the artist intended.

It has been a disputed question, and one which I will not raise this evening, whether the photographer should or should not be considered an artist. If artist meant or means only picture-maker, then, of course, my brethren of the stained fingers would come under that coveted title; but I am afraid that not only them, but many, very many, of the brethren (if they will allow me to call them so) of the palette and brush must be put in the same category; mere copyism, no matter in what medium, is not art —creative art—but simple imitation.

I have heard it stated that imitation was the sincerest flattery, but I am not aware that Dame Nature ever cared much for that, and to what evils it leads may be seen in the extinct art of the grandest as the earliest nation of antiquity, Egypt, where imitation, and that of early and therefore crude forms, became a matter of religious belief, or a matter of priestly ordination and sacerdotalism, and thus crushed out of the artists of the time all power to exercise the imagination—a power which then passed to the Greeks, who became the most imaginative and perfect of all artists.

So much for the ancient forms and phases of imitative art. But there exists in the Empire of China a living, if not a petrified, example of the danger of mere imitation in art. I need say nothing more of Chinese art than this: that if technical ability and capacity for imitation means art, then the Chinese are a race of artists. But they are not. They have in a high degree what so many of our own possess, the capacity of copying almost as closely as does the camera; but that does not therefore make them artists in the higher or true sense. We cannot approach them in such decorative art as painted porcelains, but there they stop. This should teach a lesson to a large proportion of our artists, that mere copying of bits from nature is not necessarily the highest form of art, but simply ranking pretty much on the same level as that of our careful and artistic photographer who studies his subjects carefully, selects his point of view and proper time of lighting, and makes his negative which may be exceedingly fine, calls it a work of art, a thing which by its nature it cannot be (it is a pity, but it is so.)

This brings us back to the fact that I at the next ordinary meeting of the Society shall get a good word-drubbing for my heterodoxy, but I suppose I must grin and bear it, as so many heterodox believers and teachers have had to do before.

The quality or qualities of the pictures to be thrown on the screen you must make yourselves judges of, and compare, if necessary, with similar photographic subjects from nature which you may have seen; but I think, on the whole, it would not be advisable for me to make the comparison, so for this evening we will be gratified and thankful in being allowed to have use of and liberty to examine and criticise some of the finest of modern pictures in the form of photographs.

Of sculpture I am sorry to say we are not so well supplied as we should have wished to be; but there seems to be a most curious and unacountable deficiency in this branch of art in this country, more especially as those who may be supposed to be able to commission such works are as a rule those who pride themselves on their high appreciation of art; but it would seem as if portrait busts and memorial tombs were thought to be the only use our wealthy men could make of the Divine faculty granted to our sculptor. Let us hope they will get their eyes opened to the error of their way, and spend at least some small portion of their well-earned wealth in promoting the growth of that art which has as yet barely succeeded in asserting that it can and must grow, and grow to the great benefit and advantage of the whole community.

FRILLING.

It is to be hoped that ere long the makers of gelatine plates will find some means of getting rid of frilling for good and all. That there is a movement in that direction is evident from the fact that frilling is much less frequently mentioned than formerly in the journals and society meetings. Still one does still occasionally hear of it. When it does occur with a batch of plates, it is well to know how to deal with it.

The alum bath is a capital thing for plates that show a tendency for frilling, but that, of course, cannot be used until *after* the plate is developed, and frilling does sometimes begin even while the plate is in the developing solution. This case can be dealt with by very simple means. If, instead of the pyrogallic acid solution being entirely aqueous, it be made with half water and half methylated spirit, and with a double dose of pyrogallic acid in it, all tendency to frill will be completely suppressed, and it will only be necessary to follow up with the alum bath, in order to bring even the tenderest of films safely through all the rest of the bathing and washing.

The spirituous solution has one drawback; it seems to change more rapidly than the ordinary solution; but that is a trifle. About double the quantity of pyrogallic acid is required to produce the same density that the normal aqueous solution produces.

The Photographic News.

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WET AND DRY PLATES.

"What is to become of the collodion makers?" is a query that has frequently been put of late; and really, with the dull winter months still vividly in our minds, we may well ask the question. Photographers have simply left photography alone, or they have sought refuge in gelatine plates. But very few have occupied themselves with the silver bath and wet collodion, for the simple reason that the foggy weather rendered camera work with these impossible. But as the sun gets higher every day, so do the hopes of collodion-makers rise, and there are some who tell us that when midsummer comes round again there will no longer be that marked difference between the sensitiveness of the gelatine film and that of the wet collodion plate.

In other words, the sensitiveness between gelatine and wet collodion is much more marked in dull than in fine weather. Experimentalists have shown that in the recent winter they have been able to secure pictures upon gelatine plates with a twentieth part of the exposure necessary for wet collodion, but they will not be able to do this in the summer time. In the same way as the bromine salts are found to be more sensitive to the least refrangible rays of the spectrum, so they are more impressed by our dull daylight than are iodine salts. We have long known this fact. Iodine alone is apt to give us very bright but very hard pictures, and for this reason we introduced bromine salts into our collodion as well. An iodised collodion never gives such half-tones, such detail in the foliage of a landscape picture, as a bromo-iodized collodion. The photo-lithographer, who wants a negative with marked contrasts, would be content to employ collodion containing iodine salts only, but few others; bromine salts are absolutely necessary to secure delicate detail in the shadows, and to reproduce the least refrangible rays of the spectrum. Iodide is more susceptible to the violet end of the spectrum, while the red end impresses bromide more effectually; and there is little doubt that in winter time our light is richer in red rays.

The great value, then, of the gelatino-bromide film is that it is impressed by dull daylight, which has little effect upon wet bromo-iodised collodion. But this will not be readily abandoned by photographers. The gelatine plates, soft and delicate as their images undoubtedly are, do not surpass in their results those of wet collodion in our lighter months, and since this is so, we shall be still glad to avail ourselves of the beautiful process that has stood us in good stead so long. In a word, we fully believe that while gelatine must be henceforth practised by every photographer, the collodion plate will still remain a favourite. The rapidity of the manipulations, the ability to watch closely every change, and the modifications to which the wet plate may be subjected in skilful hands, are all merits not to be lightly valued, while, as we have said, the great disproportion in the sensitiveness of the two films in the winter months will be much less remarkable when we are favoured with abundance of daylight.

Therefore there need be no fear for the collodion makers. They will still be able to take good care of themselves, and doubtless find ample sale for their wares. The wet collodion process, all said and done, still remains the simplest in the hands of the unskilled, for they can watch the changes in the image with less difficulty, and less care is necessary in excluding light from the dark room—matters that are so frequent a cause of failure to beginners. A photographer must have mastered the wet process thoroughly before he can hope to make way in the technical branch of the art, since dry plate photography is replete with niceties of manipulation. A mediocre wet plate may give satisfaction, but unless a dry negative is thoroughly good, it will not pass muster at all.

A NEW STYLE OF PORTRAIT.

Photographers have evidently made up their minds that it is high time to introduce some new style of portraiture to the public, and we entirely agree with them. The carte and cabinet are very well in their way, and will long continue to be demanded by the public; but there cannot be a doubt that if some other *format* could be made popular during the ensuing season, a considerable impetus would be given throughout our little photographic world.

It must not be forgotten that there is something else besides art which makes a picture sought after by the public, and that is fashion. Several innovations that have come to us from abroad owe their popularity not so much to art—although they may have been in themselves artistic —as to a certain amount of elegance, "gō," *chic*, or whatever it is termed; the cameo-faced portraits, and those with ornamental margins, are instances of this, and, although neither enjoyed popularity for a very long time, this popularity was certainly due to fashion more than anything else, and, it cannot be denied, put money in photographers' pockets. Therefore, we say, in introducing a new form of portrait to the public, let it be as artistic as you like, but let it possess something else besides.

Photographers, as we say, are everywhere desirous of securing an innovation of some kind, and many of them are ready with this innovation to hand. They not only want to have their own way, but their own way of having it. Now it is our opinion, and we simply give it for what it is worth, that if a new portrait is to be a success, it should be essentially different in character to the carte and cabinet of the present day. It should possess style as well as art qualities, and for this reason, as also from the fact that a picture, which was termed originally by Mr. Valentine Blanchard the "boudoir," has already made a start in this country, on the Continent, and in America, we earnestly hope that this *format* will be adopted generally. Whether, as the word "boudoir" has been rather vaguely used of late, it would not be better to make use of the term "panel," is a matter for after-consideration, but a print measuring seven and three-quarter inches by three and three-quarter inches is the size to which we definitely refer, and for which card mounts have long since been made by all mount manufacturers. A portrait of these dimensions cannot fail to please with the public just now, more especially since the present fashion of ladies' dresses will conform well to the dimensions in question.

One thing is clear. Photographers must pull together if they want to make a definite step. This we urge upon them very earnestly, and if any suggestions come to us on the subject we will readily give them the publicity of these columns.

Notes.

Our readers will be glad to hear that the popular President of the South London Society, the Rev. F. F. Statham, is slowly recovering from the dangerous attack of bronchitis from which he has been suffering.

The Woodburytype patent has lapsed after running the usual fourteen years. The invention was made the subject of a patent in 1865, and in January, 1866, we presented our readers with an illustration of the process.

Photographers may sing the praises of gelatine and collodion as much as they like, as the best vehicles for sensitive salts, there is evidently one branch of the art in which albumen—that served for the first glass pictures ever made—still holds prominent rank. In micro-photography, Dr. Regnaud has found, as other experimentalists have done before him, that the photographic image is never so fine and clear as when impressed upon an albumen plate.

It is well to note that "a Berlin-wool pattern" of a picture is deemed, by the law of Great Britain, to be an infringement of copyright. The proprietor of *Bow Bells* has been sued for issuing a reproduction of this kind of Millais' well-known painting of "The Huguenots."

Those who make lantern transparencies by means of the carbon process—certainly one of the easiest means of producing these charming pictures—will do well to employ only Indian ink tissue for the purpose. The difference in expense is altogether immaterial, and the transparency is sure to be free from accidental specks and points, which are so visible always in an enlargement.

Mr. Henry Butter, the manager of the Royal Carriage Department, to whom photographers owe one of the most practical descriptions of the photo-lithographic process, has promised to re-write the details which appeared in our Year-Book of 1867, so as to bring them up to date. The memoir will shortly appear as one of our Topics.

The story of the diamond making is a very brief one. A hydro-carbon gas—such as marsh gas, for instance, which is composed of hydrogen and carbon—is put into a stout iron tube of considerable thickness. A nitrogen compound—presumably cyanogen—is also introduced, with a view to the nitrogen combining with the hydrogen, and leaving the carbon free, for a diamond, as our readers are aware, consists of pure crystallized carbon. The gas in the iron tube is subjected to enormous pressure to liquefy it, the tube being heated to aid in this work. The liquefaction of oxygen by Pictet, of Geneva, was effected by pressure in this way. The pure carbon passes under pressure from a gaseous into a liquid form, and finally crystallizes, in which condition it is found, upon the iron tube being opened. The diamonds are, however, of the most minute character, and Mr. Hannay, of Glasgow, who has thus succeeded in making them, frankly owns that the game is not worth the candle.

The note on "Frilling," by a well-known manufacturer of gelatine plates, which we publish in another column, will be welcome to many who are new to these films. By making up his pyrogallic solution with half water and half methylated spirit he ensures the gelatine from leaving the glass, should plates show signs of this defect before they are completely developed.

The brown tint sometimes seen in fixed gelatine negatives is due, according to Mr. Mayland, simply to the fact of the developing solution becoming exhausted. By employing a larger quantity of developer, the defect at once disappears. With two ounces of developer, for instance, let it remain ever so long in contact with the film, the brown tint is never got rid of, while on the employment, say, of four ounces, the negative, when placed against white note-paper, shows no trace of colour at all in the transparent portions.

At the distribution of prizes at the Female School of Art, by the Baroness Burdett-Coutts, on Monday, we noted the presence of two young ladies, Miss Ethel Spiller and Miss Edith Robinson, daughters of gentlemen well known in the photographic world. Miss Spiller has been successful in securing the Gilchrist Scholarship, valued at £100.

In a note on the researches of M. Stas into the various forms of silver bromide, of which an account will be found in another column, thé Editor of the *Photographisches Archiv* remarks that the results obtained by the distinguished Belgian *savant* throw great light on the theory of the preparation of emulsions. The special form or condition of silver bromide most sensitive to the action of light seems to have been produced by M. Stas by means of boiling the ordinary salt in water for days together. Is there not something analogous to this in the long-continued cooking to which highly sensitive gelatino-bromide emulsion is submitted? Further, may it not be possible to produce the sensitive bromide by boiling in water, and to make the emulsion by mixing the bromide thus prepared with the solution of gelatine? The advantage of such an operation would be that the gelatine would preserve its power of setting quickly, which by the long emulsification it is apt to lose.

Possibly, a similar method of proceeding would avail for making collodion emulsions. It would only be necessary to precipitate the silver bromide, to digest it for several days in boiling water, to separate the water by washing with alcohol, and finally to shake up the salt after this treatment with ordinary collodion. There seems reason to suppose that a process of this description would suffice to give us collodion emulsions greatly superior in sensitiveness to the ordinary wet plates, which compare so unfavourably in that respect with the dry ones.

Silver metallic stains upon gelatine negatives, of which many of our readers have complained, are easily removed by the application of a weak solution of cyanide of potassium—say of three per cent. strength.

Dr. Shorthouse says in the *Lancet* that hot steam at once diffuses fog. "A room which before was so dark that you could not see to read, write, or even eat in the daytime without the use of artificial light, can, within a few minutes, be rendered comparatively light" by a steaming tea-kettle. A bronchitis kettle, which has a long spout, is, however, best for the purpose, and this should be kept filled, for a full vessel gives off much more vapour than one only partly filled.

Mr. Muybridge has, according to the *San Francisco Chronicle*, been using his method of instantaneous photography for obtaining a series of records of the position of the human body and the successive action of the muscles in various athletic exercises. The arrangements were similar to those which he adopted in taking views of the motion of a horse when trotting or galloping. His experiments, which seem to have been perfectly successful, were carried out at Minto Park, the summer residence of Mr. Leland Stanford, during a fête given at that place by the owner to the members of the Olympian Athletic Club.

The first subject who submitted to be posed (under the circumstances, perhaps posed is hardly the word to use) was Mr. Lawton, the President of the Club, of whom, while executing the *salto mortale*—that is, while leaping into the air, turning a summersault, and returning to his feet again in the same place—fourteen views were taken, showing this revolving figure in different positions of his flight. Mr. Brandt afforded an excellent study for observing the play of the muscles while lifting a weight of 150 pounds from the ground to arm's length over his head; during this operation, fourteen views of the figure were taken. Two of the athletes engaged in a boxing-match, and several views of them were taken while in the different stages of the contest; these, when enlarged, as it is intended they shall be, will form excellent studies of the figure. Perhaps the most interesting experiment was that afforded by Mr. Lawton, who, in executing the high jump, leaped through fourteen threads, stretched at equal intervals across his line of flight; each of these, when broken by the athlete, opened the shutter of the camera, thus giving fourteen instantaneous views of the leaper in different positions.

It is Mr. Stanford's intention to have all of the views taken on this interesting occasion enlarged to cabinet size, and a number of prints from them he will bring with him to Europe. There will be, also, two life-size copies taken of each, and finished in oil colour, one of which will be presented to the Olympian Club. Here are studies for the Life School of the Royal Academy.

Military Photographer (*about to uncap lens to get a picture of a nervous recruit*): "Stand still, can't you? By Gorra, sir! if you so much as move a muscle of your face, I'll have you locked up in the guard-room for a week. Atten-TION!"

Topics of the Day.

CARBON PICTURES ON OPAL.

BY J. R. SAWYER.

The presence of a fair and legitimate competition in business has always a beneficial effect, as it ever tends towards improved methods of procedure and greater variety and perfection of result. To this sort of healthy competition is due the many and various kinds of work that wise and businesslike photographers spread, like tempting wares, to obtain that agreeable and necessary transfer of cash from the pocket of the purchaser to that of the producer, which means business.

In calling the attention of the readers of this journal to the production of pictures on opal, it is quite to be understood that there attaches no particular idea of novelty; it is a good old safe method of adding to the professional earnings, and is largely practised by those who move with the times (not the *Times* newspaper), and are shrewd enough to know upon which side their bread is buttered.

Photographs on opal are certainly no novelty, and the retrospective view of the experienced "professional" conjures them up in many forms. Certainly the earlier ones come up in such questionable shape, such pale wan ghosts, wrecks of what were once things of beauty, that "avaunt and quit my sight," is not unlikely to be the exclamation that greets them; but carbon pictures on opal are as invulnerable as Achilles; true, like him, they may have a little place where the lance of the "silver" champion might establish a small "raw"; some little loss in that delicate roseate hue conferred by the too fleeting cochineal colour, the brilliant but faithless carmine of old days; but practically the carbon picture on opal is as good as ever, permanent as a water-colour or an etching, and worth the guineas paid for it.

In working carbon prints on opal it will be necessary to exercise some care in the selection of the glass, the range of price in this article is somewhat remarkable, but as a rule the cheap kinds have not been found satisfactory, the glass being very uneven, and the surface unsuitable. The opal best suited is that which is known as pot metal opal, and has the colouring matter diffused through the entire body of the glass; it should be polished on one side and ground on the other, and it is a point of some importance to have this grain of a suitable nature; the graining can be done in a variety of ways. Sometimes it is produced by the action of fluoric acid; when this is the case it should be rejected at once; sometimes the surface is grained by the sand blast process, and the glass looks exceedingly nice and suitable; but in use, it will generally be found that, owing to the glass not being perfectly homogeneous in its constitution, the particles of sand will have attacked weak or soft places in the glass, and eaten it here and there into little pits, which, not showing until the glass is wetted and put through the necessary operations, will be pretty certain to prove pitfalls in the road to success.

The only proper kind of opal to use is hand-smoothed opal, medium grain, neither too fine nor too coarse; the former not affording sufficient tooth to hold the picture safely, the latter giving a disagreeable coarse appearance to the finished work.

The surface of the opal destined for the reception of the picture should be clean and thoroughly freed from anything of a greasy nature; this is perhaps best accomplished as follows:—Procure a piece of planed wood, about three-quarters of an inch thick and somewhat larger than the glass intended to be used; make this into a sort of low stool by attaching to each end a cross-piece about four inches deep; lay this in the sink, put the opal upon it, and with a nail-brush and some common brown soap thoroughly scrub the grained surface, using warm water; rinse off the soap under the tap, using the nail-brush to thoroughly get rid of it; allow the plate to drain,

and for a final application flow over the plate a little distilled or filtered rain-water; stand up in a clean rack to dry; the surface should not be touched or wiped in any way, simply allowed to dry spontaneously.

The next question to decide is, what colour is it desirable that the picture should have? And here the advantages of carbon, or, as it should be called, "pigment" printing, tell with full force; almost any colour known to Art can be readily produced. The lovely pictures of the children of the Prince of Wales, exhibited by Mr. Robert Faulkner at the last Exhibition, were produced by him in the Autotype Company's "red chalk" tissue. Admirable results have been secured in sepia, but as a rule, and for ordinary purposes, a good rich warm brown is very suitable; what is known as Standard Portrait Brown gives very fine tones.

It will be necessary to consider if the pictures will have to be made by the double or the single transfer process; if it is required from a negative already in existence and taken in the usual manner—*i.e.*, not reversed—it must be produced by double transfer, but this has been rendered so easy and certain by the use of the flexible support that it will impose no difficulty upon the operator.

It is very important that the negative should be suitable; a hard negative, giving violent contrast, is absolutely unsafe to use, because such a large quantity of gelatine is left upon the deep shadows that a breaking away from the glass, due to contraction in the gelatine, is very likely to occur, and this may not show itself till months after the picture is finished; if the original negative, therefore, is not suitable, it had better be reproduced by making a carbon transparency, helping the original by covering it with "*papier minéral*," and cutting out the lighter portions so as to secure harmony and softness; from the transparency a dry plate negative can be made by contact printing with a paraffine lamp, and a reversed negative of a suitable character that can be printed by single transfer will be the result. It generally happens that an enlarged portrait is desired for opal; this can be made from a transparency in the usual manner in the camera, using either wet or dry plates, but the great point is to produce a soft negative, having no very violent contrasts.

It must be presumed that the reader is acquainted with the ordinary details of carbon printing, and that the tissue has been printed to the proper depth, and is now ready to be placed upon the opal. Take a piece of cleaned opal from the rack, and immerse it with the printed tissue in perfectly clean cold water; the temperature of the water should not exceed 56° or at most 60° Fahr., and in hot weather it must be kept down to something like this by the introduction of pieces of clean ice from time to time, or by standing the tray in an outer one containing rough ice and salt. Almost as soon as the tissue enters the water it begins to curl, first inwards—*i.e.*, towards the gelatine surface; in a few seconds it will begin to relax and soften; now pass the palm of the hand over it to remove any adhering air-bubbles, and when it has nearly straightened itself out (but not quite) adjust it over the surface of the opal reposing at the bottom of the tray; lift both out together and place upon the wooden stool for the application of the squeegee. Before proceeding to this stage it may be well to call attention to the method of getting the image in its correct place on the opal. It is not necessary, except in cases when the picture is to be printed fully out, to have the tissue the full size of the plate; and as vignettes are the rule, and make incomparably the prettiest pictures, it is of some importance to know that the head is placed in the correct position. This can be very simply managed by sketching in, with a pencil, a rough outline of the head and bust upon the back of the tissue before it is retired from the pressure frame; this will at once enable the operator to see where the picture will come, and enable him to adjust it with precision before the application of the squeegee.

To squeegee a carbon print is, like many other things, very easy when one knows how; but judging from the many failures that take place, most of them attributable to faults in this particular operation, few people do know how. The printed tissue being in its proper position upon the opal, take the squeegee in the right hand, and hold the opal firmly with the fingers of the left; now apply the squeegee with a moderate, even pressure, a little past the centre—*i.e.*, nearer to the left hand; now, with an even, steady stroke, sweep off the water clean over the right-hand end, turn the plate round and repeat the operation for the other half, the plate commencing as before a little past the centre. The tissue will now be flat upon the plate; the squeegee should now be used with some amount of force from the centre to the ends in each direction, so as to ensure absolute contact between the surface of the tissue and the grained face of the opal; the opal may be now placed upon a table, a piece or two of thick blotting-paper or bibulous board laid upon the picture, then a sheet of glass or metal, and upon that something heavy; it should now be allowed to repose for a quarter of an hour or so.

The foregoing method supposes that the negative is a reversed one, and that the print can be developed straight upon the opal, but should the print be required from a negative made in the ordinary manner, a modification will be necessary. A print from an ordinary negative developed straight upon the opal would be reversed. To avoid this, it must be developed upon an intermediary or temporary support, from which it can be transferred to the opal; this is best accomplished by using the patent flexible support, in the manner following: Take a piece of the support a shade smaller than the plate, and treat it as follows: rub the glazed surface with a piece of soft flannel moistened with a little of a waxing compound, composed of yellow resin six drachms, pure beeswax two drachms, turpentine one pint; having rubbed this well into the surface coating, polish it off lightly with a second piece of soft flannel, avoiding any heavy pressure; the action of a French polisher is exactly what is wanted; allow it to remain for a few minutes till the spirit has entirely evaporated, and the support will be ready for use.

Place the printed tissue and the piece of support in the tray of clean cold water, and when the tissue has expanded bring the two surfaces into contact under water, lift out together, and place upon a zinc or glass plate resting on the wooden stool, the back of the tissue uppermost; apply the squeegee as before described, and allow the two adherent sheets to rest under a weight and between bibulous paper for a quarter of an hour. The development of the picture is carried on in the usual manner by placing it in water of a temperature of 110° to 120° Fahr., and calls for no special remark; the treatment does not differ in the least from ordinary carbon methods. After development an immersion in the alum bath for a quarter of an hour, followed by a thorough rinsing in clean cold water, and the print developed upon the support may be considered finished.

The transference of the picture now resting on the temporary support is conducted as follows:—The picture should be allowed to dry spontaneously; make up a solution of Nelson's No. 1 fibre gelatine, two ounces; water, eighteen ounces; soak the gelatine in the cold water, and raise to a gentle heat; when perfect solution has taken place, stir into it, with vigorous action, a small quantity of a thirty-grain solution of chrome alum, adding the chrome alum solution, in very small quantities, and stirring vigorously. It is difficult to say how much may be added, as gelatine varies very much in its behaviour with chrome alum. Probably this amount of solution will take about six drachms of the chrome alum solution; if too much be added, the whole goes into a viscid mass, and may be thrown away at once; if too little, the fluid will be too thin and watery, and not have sufficient strength to hold the picture firmly to the opal. A few experiments, and the loss of a

little gelatine, will soon show the operator where he has got to.

The transfer solution being ready, and at a temperature of about 100° Fahr., should be placed in a tray large enough to receive the opal; or the opal may be placed on a levelling stand, and some of the solution poured upon it, distributing it over the surface with a piece of clean paper. The picture on the temporary support, which should have been placed a short time previously in cold water, is now applied to the surface of the opal resting in the gelatinous solution in the dish, being very careful to exclude air-bubbles, or it may be imposed upon the plate covered with the gelatinous solution resting upon the stand; the squeegee is now applied as already described; the opal, with the temporary support adhering to it, is allowed to dry spontaneously, and when perfectly dry, the support may be stripped from the glass, leaving the picture firmly anchored to its grained surface. The piece of support will only require to be rubbed over with a little of the waxing compound to be perfectly ready for use again.

A great deal may be done to a picture in opal with very little trouble. A judicious application of ink eraser will improve the vignetting, put in high lights, clean up margins, soften harsh shadows, and impart an artistic character to the work. From good and suitable negatives prints on opal have beauties peculiarly their own; they are exquisitely soft and delicate in appearance, and are susceptible of a great range of artistic treatment both in monochrome and colour.

The Topic for next week will be "Modern Photo-lithography," by Mr. Henry Butter.

INVESTIGATION OF THE DIFFERENT CONDITIONS OF SILVER BROMIDE.

BY M. J. S. STAS,
Member of the Royal Academy of Belgium.

[We reproduce the following important paper from the *Bulletin de l'Association Belge de Photographie*, in which it has been republished by permission of the author from the *Annales de Chimie et de Physique*. An accurate knowledge of the properties of silver bromide is indispensable to the photographer at the present day.—Ed. Photographic News.]

Bromide of silver assumes several different physical forms or aspects. It exists:—

1. In the white flocculent condition.
2. In the yellow flocculent condition.
3. In the state of a deep yellow powder.
4. In the state of a pearly white powder.
5. In the granular state of a yellowish white colour.
6. In a crystallised or fused condition with a deep and pure yellow colour.

1. *Of the Flocculent Silver Bromide.*—This substance is formed, as is well known, by the double decomposition of cold and very dilute solutions (from ½ to 1 per cent) of a salt of silver of hydrobromic acid in a bromide. Provided the double decomposition has taken place in the presence of an excess of the silver salt, the precipitate is quite white; but when there is an excess of hydrobromic acid or of an alkaline bromide, it is of a deep yellow colour. The white or yellow flocculent particles separate easily and quickly when agitated in a neutral liquid, but more slowly if that liquid be acid. Bromide of silver in the flocculent condition possesses the property of clarifying liquids that have been rendered turbid by the presence of silver bromide, and it preserves this property the longer in proportion as the original acidity of the mother liquor was greater, always provided that that is confined within the limits of one and ten per cent. Both the white and the yellow—but more especially the yellow—flocculent particles, when left to themselves, soon aggregate into a glutinous precipitate of a white inclined to yellow, or of a deep yellow colour, according to the original colour of the particles. When this precipitate is dried in the air, it contracts into a hard and opaque mass of a deep yellow colour. Flocculent silver bromide, whether white or yellow, blackens rapidly in diffused light, but after it has contracted and hardened, diffused light only renders it superficially of a greenish colour. In solutions of alkaline acetate the flocculent particles separate of their own accord, as will be shown hereafter.

2. *Of the Silver Bromide in Powder.*—Flocculent bromide is transformed into the powder by agitation in water; this transformation is accomplished very rapidly when the flocculent particles have been produced in a neutral liquid, and much more slowly if that liquid be acid. The bromide is turned into a fine powder, of a yellowish white colour by diffused daylight, and of a light green-grey by candle or gas light. When washed and agitated in water it forms a thick pasty mass, which, poured into a funnel covered with a linen cloth, allows the water to pass though only with difficulty. Being dried in the air, but protected from the light, it contracts, but remains a yellowish white powder. In the pasty condition it is altered by the action of light less than the flocculent bromide. There is also a bromide in the state of powder of a pearly white colour which seems to be a special form of the granular bromide.

3. *Of the Granular Silver Bromide.*—When either the flocculent or the pulverulent silver bromide, suspended in water, is poured into boiling water, it separates at once into an extremely fine dust, or, in other words, assumes granular form. This form may be also produced directly by adding a very dilute and boiling solution of ammonium bromide to a solution also boiling, of 1 part silver nitrate in 1,000 parts water. The granular powder produced from the disagregation of the flocculent particles has a dull yellowish white colour; that obtained by the transformation of the pulverulent bromide, as well as that which arises from the mixture of the dilute solutions, is of a brilliant yellowish-white colour. When the granular bromide is kept in a boiling condition for several days, the water lost in evaporation being continually replaced, it becomes more and more subdivided, until it remains completely held in suspension, and causes the water to assume a milky appearance; in this condition it gives a brilliant reflection, and falls extremely slowly to the bottom of the vessel. Separated from the liquid, it is of a pearly-white colour, and when brought into contact with a concentrated solution of ammonium bromide, turns instantaneously to a pure yellow tint. Both the dull coloured and the brilliant forms of the granular bromide, as well as the milk-white solution, obtained by the action of boiling water on either of these modifications, are substances the most sensitive to light that are known. Heated for only two or three seconds in the flame of a Bunsen burner consuming an excess of air, they blacken directly. In consequence of this extreme sensitiveness, the experiments with these substances must be undertaken with the greatest care. The pearl-white form of the silver bromide passes over to the pure yellow modification when fused.

4. *Of the Degree of Solubility of Silver Bromide in its Various Modifications.*—The bromide of silver, both in its flocculent condition and in that of powder, may be regarded as practically insoluble in pure water as well as in water acidulated with either nitric, sulphuric, or acetic acids, so long as these liquids have a temperature below 33°; above that temperature it is sensibly soluble. The granular bromide, whether in the yellowish-white or in the pearly-white modification, gives certain proofs of solubility only when raised to a temperature above 50°C; even above 100°C it is very faintly soluble, though sufficiently so to allow of its coefficient of solubility being determined with exactness. If, at ordinary temperatures, to a solution of one part of silver nitrate in two million parts of water, there be added the requisite amount of hydrobromic acid, or of a bromide salt, at the end of three minutes at most, an opalescent zone

will appear at the bottom of the vessel when the liquid is pure water; but when it contains five per cent. of nitric, or of sulphuric, or of acetic acid, this zone will be seen to form at the top. When the degree of dilution of the nitrate of silver solution is carried to one part in four or five millions, on adding the proper amount of hydrobromic acid or of a bromide salt, a slight turbidity makes its appearance in about twelve or fifteen minutes. Even a dilution of one in ten millions will show some turbidity, but this is the extreme limit. Pure or acidulated water which has been kept for hours in contact with the various modifications of silver bromide above described at a temperature not above 33°C., and then cooled down to zero, remains quite clear. But when water at a temperature of 33°C. is kept in contact with silver bromide, especially in its flocculent condition, it loses its limpidity on cooling, and becomes turbid to a degree in proportion to the temperature above 33°C. that it was raised; this phenomenon is more observable in acidulated than in pure water.

ON A PROCESS FOR PRINTING BY DEVELOPMENT.

BY CAPTAIN ABNEY, R.E., F.R.S.*

Plain Paper Prints.—In the first process I worked at recently my great desideratum has been to get rid of all free silver nitrate, both in development and in preparation of the paper, as then we shall have a paper which will be stable, and not decompose and blacken as is the case with the above process. This experimentation has occupied me some months, off and on, and it is only recently that I have hit on a really satisfactory formula. A solution is prepared as follows:—

Potassium iodide	... ...	400 grains
Potassium bromide	... ...	250 ,,
Distilled water	... ...	20 ounces

and a solution of iodine in alcohol is added till the mixture assumes a deep claret colour. After filtering, any convenient number of sheets of paper are immersed in it in a dish, and allowed to remain for an hour; great care being taken that no air-bubbles are present. The sheets are turned over two or three times during this period and hung up to dry, the drainings being absorbed by blotting-paper to prevent unevenness at the lower end. When dry they may be packed away between clean blotting-paper (free from sodium hyposulphite), and may possibly then turn a brown colour. The paper should not be handled with hot or dirty fingers, or defects in the prints will be seen. When dry, the sheets are floated on the following solution:—

Silver nitrate	... ...	500 grains
Glacial acetic acid	... ...	1 ounce
Distilled water	... ...	2 ounces

The smooth side of the paper is placed on the fluid in the same manner as albumenized paper is sensitized. After a couple of minutes the purple or brown colour of the back of the paper will gradually disappear, and be replaced by the yellow tint of bromo-iodide of silver. The sheets should rest two minutes more, and then be removed to a dish of distilled water to remove excess of silver. Two more changes of water will be required before the paper is in a keeping condition; after which it may be drained, all excess of moisture blotted off, and then hung up to dry. When *quite* dry the paper is ready for use. As far as this, the process is like that of Colonel Greenlaw,* which I arrived at independently, and after some waste of time. If the camera is to be used, the exposure is about six times that required for a wet plate, but as paper processes are out of date, I may presume that it would be really used for printing by development. In Greenlaw's process the development is effected by gallic acid and silver nitrate, but I have abandoned that in favour of the *ferrous oxalate* developer. This developer has been often described in the Journal, but in order to make references complete, I will point out how it can be made. A saturated solution of neutral potassium oxalate is made by the aid of heat. When cool an excess of ferrous oxalate is added, and well shaken up. After four or five hours the solution will be saturated, when it can be decanted off and used, adding a further small quantity of neutral potassium oxalate. This is a slightly different mode of preparation to that I have previously given, but it is effective. To develop an $8\frac{1}{2}$ by $6\frac{1}{2}$ print, $\frac{1}{2}$ an ounce of this solution is taken, and an equal bulk of a (20 grain to 1 ounce of water) solution of potassium bromide is added to it. This solution is diluted with an equal quantity of water. The paper which has been exposed behind a negative, or in an enlarging apparatus, is placed face uppermost in a dish and covered with water. This is drained off, and the developing solution poured on. After a minute the image begins to appear slowly, and after five or six minutes takes full density, the whites remaining perfectly unclouded. The paper may occasionally be held up to the light, and the back examined to see what progress is made, and when the outline of the darkest parts appears on the back, the image may be considered as sufficiently brought out. The paper is then well washed, and placed in a strong fixing-bath of sodium hyposulphite. This fixing takes a long time, sometimes as much as half-an-hour, and it is not seldom that the whites have turned a dingy brown. This is due to a decomposition of the iron salt left in the pores of the paper, but it is of no consequence, for after well washing the paper should be covered with a weak solution of hydrochloric acid (1 part to 40 of water), when the whiteness of the paper will be restored completely. After a further washing, the print is hung up to dry. I have found that it is generally advisable *before fixing* to use the hydrochloric acid solution, or else a solution of neutral potassium oxalate and a little free oxalic acid with it. Unless the water for washing be distilled, or rain water be used, the hydrochloric acid is perferable, since all trace of calcium oxalate is thereby avoided. This dissolves out all the iron salt in the paper, and after well washing the print is rinsed with water smelling faintly of ammonia, and immersed in the fixing bath. This last is the safest plan to adopt, since no acid can find its way to the sodium hyposulphite which might be in the pores of the paper through imperfect washing. When dry the tone will be of a beautiful ivory black, so characteristic of the ferrous oxalate development, and can hardly be distinguished from those beautiful platinotype prints which we admired so much at the last Exhibition in this gallery. The paper I use is ordinary plain Saxe paper, of good quality, and having very few blemishes. Sometimes the print appears dead, being too much in the body of the paper. In order to get rid of this difficulty, I have had recourse to the next modification.

(To be continued.)

* Continued from page 101.

* See Year-Book of Photography, 1870, on "*Instruction in Photography*," 4th Edition, page 100.

Correspondence.

MR. BASSANO'S STUDIO.

Dear Sir,—Referring to your notice of my studio in this week's Photographic News, I find that in the pleasant interview with you which preceded that notice, I inadvertently attributed the quotation, "Secrets! Lord bless you, I have none to tell," to Addison, whereas it should have been to Canning: the exact words are, "Story! God bless you! I have none to tell, sir," and are uttered, as many of your readers will recollect, by that author's celebrated Knife Grinder. One is so apt to associate all the brilliant writers of the seventeenth and eighteenth centuries into one great fraternity of wit and good sayings that it is difficult sometimes to remember to whom to attribute those gems of thought which have since become famous, and which are so useful in expressing exactly what we mean. Kindly afford me an opportunity to make this correction, and believe me, yours, faithfully, Alexander Bassano.

THE VENUS OF MILO.

Dear Sir,—Your Correspondent, "J. S.," may care to know that an extremely fine cast of the Venus de Milo has recently been placed in the Elgin Room, British Museum, by Mr. C. T. Newton, the learned keeper of the Greek Antiquities, for the use of students. As with other things, there are casts, and casts!—Yours truly,

Stephen Thomson.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday next, March 9th, at the Gallery, 5a, Pall Mall East, when a paper will be read on "Photographs Collected during a Tour Round the World *via* Siberia and California," by the Rev. Henry Landells, F.R.G.S.

Obituary.—We regret to announce the decease of Mr. H. Claudet, photographer, of Regent Street, which occurred on the 22nd ult., after a very short illness. Mr. H. Claudet was the second son of the late Mr. A. Claudet, F.R.S., the eminent photographer who began to practise the art almost as soon as it was discovered, and whose loss was a serious one to the whole profession.

Photographic Accessories.—Messrs H. & H. J. Timperley have forwarded us a series of photographs representing some new accessories they are manufacturing. Judging by the tint of the pictures, the colouring of the originals has been accomplished with some success, and the pedestal and stops which are in the series are certainly less conventional than usual.

Photographic, Compared with Pictorial, Portraiture.

Well may the life-size heads of fam'd Vandyke,
Kneller, or Reynolds, every gazer strike,
When thus, immortalis'd in living hues,
The looks of long-departed Worth he views;
Give *me*, in modest Photograph, to trace
The lineaments of some remember'd face,
Without the Painter's art, by Light's pure aid,
So finely, freely, faithfully portray'd!
'Tis all exact resemblance, all sincere;
No flattery meets us, no deception, *here*;
No human strokes with heavenly interfere!

Thomas Grinfield, M. A.

To Correspondents.

James Young.—The Woodburytype Company, Portland Road, or Autotype Company (see our advertising columns), would supply you; if not, an advertisement in our columns would doubtless get you the information.

E. Evans.—There is no *rule* among photographers or other employers. Conditions should have been stated on engagement; if this was not done, we would advise division of expenses, if the employed turns out a *bona fide* assistant.

Arthur Levy.—Thank you.

Gelatino-Bromide.—See our "At Home" this week on this very subject. There is no need whatever for the brown tint you mention. Send to Marion's.

Fred.—We cannot do as you ask; all of them are trustworthy.

A. F. M.—The Autotype Company will be glad to let you have any quantity of the Indian ink tissue, for transparencies; they sell precisely the same kind that they use themselves. Try a drop of castor oil in four ounces of collodion.

Turncoat.—We think you are too harsh in your opinion; perhaps he has changed his mind. He might reply: "What's the good of having a mind, if you can't change it?" At any rate, there are many of us who are not so clever at twenty-one as we then imagine ourselves to be.

Triton.—Yes, you may remove the surface colour by fluoric acid, which readily dissolves glass, but the making of nicely graduated vignettes is no easy matter. Do not allow the acid to touch fingers; it bites.

George Morley.—There is a fluid sold for diluting marine glue; we can recommend you no better mixture for coating it, if it is to hold fluid.

W. W.—They are printed on plain salted paper. Yes, we should think they were permanent in a very great degree.

Noddie.—Easily enough, by using a stronger silver solution.

T. J. W.—We do not know of any such publication. The first you name certainly enjoys a good reputation.

Otto Von Roeth.—The Stereoscopic Company, and Mr. Van der Weyde, both of Regent Street, employ the electric light; see "At Home" in the News for 13th ult.

Photo-Litho.—See our "Notes." About the beginning of this century, Senefelder, of Munich, first discovered the art, and his name is always connected with it. Niepce's early experiments, so we are told, were incited by Senefelder's discovery of lithography.

W. Mutch.—Silk may be dissolved in hydrochloric acid. See Spiller's researches published in the British Association Proceedings for 1870. The silk solution may under certain circumstances be used like collodion, but the film never dries properly, and remains deliquescent.

Madame Niepce de St. Victor.—We have received your note, which shall have our best attention.

Carbon Tissue.—You evidently refer to the Mariotype process, which was brought before the Photographic Society in May, 1873. See the journals of that date. The process was promising, but Mr. Marion died before it had been completely elaborated.

W. M.—Write to Professor Alexander Herschel, at the School of Science, Newcastle. He is the second son of the late Sir John, and is very likely to be able to give you the information. The experiments with glass photographs date back to 1839; Professor Herschel showed us some of these six or eight years ago, so he no doubt has them still.

F. Morris.—The process has several times been given in these pages. Use Indian ink for your lines on paper, so that they are opaque. The solution for treating the printing paper is made up of—

Citrate of iron (or ammonio-citrate) ...	140 grains
Ferro-cyanide (red prussiate) of potash...	120 ,,

dissolved together in two fluid ounces of water. It will keep well in the dark, and is applied to the paper by a brush or tuft of wool. Put it under the original drawing, which serves for negative; after printing, wash in water. The result is a white design on a blue ground. The Pellet paper you speak of gives blue designs on a white ground, but the Poitevin process, details of which appeared in the News last month, is a more satisfactory process still.

Mr. J. L. Toole writes from the Folly Theatre: "Accuracy in scientific matters has been the one aim of my life, and although my study at the present moment may be said to be geological, since it is confined to *The Upper Crust*, I must ask you to insert the preamble of my lecture on photography, as the remarks you made last week scarcely do me justice. Taken in this way their bearing is obvious. 'Collodion is a mineral substance obtained from mustard and cress, grown in a warm situation on a blacking bottle constantly kept damp with pyrogallic elixir; when calcined with equal proportions of gunpowder and gutta-percha, it is known in photography as the sesqui-qua-quod of the cyanuret of potassium.'"

F. H.—We have examined it carefully, and we have little doubt it is albumen; starch might have the same appearance, but if we can scrape off sufficient we will test chemically.

W. W.—See answer to A. M. in News of 13th Feb. We have there given the formula. You cannot do better than tone with iridium and gold.

F. C.—We do not know the address of Hollingsworth and Turner.

P. G.—We have already given the address several times in these columns: Messrs. Ihlee and Horne, 13, Aldermanbury, are the agents for the luminous paint.

H. W. Bevan.—Thank you; next week.

Brighton.—You may tint in the way you mention, but must remember that the aniline dyes are very fleeting. A better plan is to drop a little, a very little, of one of Judson's dyes into some plain collodion. This may then be poured over the mounted photographs in the same way as a plate is treated; the effect of tinted collodion applied in this way is often pleasing.

W. G. Tannahill.—Thanks; but your communication reaches us this week just as we are going to press.

French Correspondence held over, owing to pressure on space this week.

Several correspondents in our next.

The Photographic News, March 12, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Printing by Development—Trying it on—The Radiograph.

Printing by Development.—It seems that the process indicated by Captain Abney is one well worthy of a trial, and probably it will be worked out to a successful and practical issue, if only a few of those who should be interested in its success will but put their shoulders to the wheel. In some experiments of our own with the process we have kept to the formula he has given, and we find that the results are everything that can be desired, except, perhaps, a slight loss of brilliancy, due to the sinking into the paper of the image. Slow development, as Captain Abney states, however, prevents this in a very great measure, and we suppose that the theoretical reasons he has given will account for it. Our object in writing on this topic at all is, however, not to discuss the merits of the process, but, supposing it to be all we can wish, to look at the possibilities arising from it. A quarter-plate negative and a magic lantern are all that will be necessary to give us a print of any size we may require, and if any one possesses a nine-inch condenser, and a suitable lens, a whole plate may give us enlargements such as at present are most feasibly produced by the solar camera, as so successfully worked by Van Monckhoven, and our own countryman Mr. Viles in his microscopic enlargements. Possessors of even larger sized negatives need not despair when we remember that monster condensers, such as are possessed by the Autotype Company, can be purchased. The production of large direct negatives, as a rule, means cumbersome apparatus, heavy loads, and a smaller percentage of good results than when the photographic paraphernalia are of the coat-pocket or knapsack size. As we have often pointed out in these columns, the desiderata for successful and comfortable photographic work are perfect small negatives, and a perfect enlarging process. The former can be obtained more easily than if the size is even confined to 9 by 7 plates. Have we at last the perfect enlarging process for printing by development? We are all familiar with the gems of pictures which certain of our artists exhibit at our annual Exhibition. Their balance and rendering are perfect on the small scale on which they are printed, and yet only full justice can be done them if they are seen of a still larger size. Have we now the possibility? It will be in the recollection of our readers that Mr. Valentine Blanchard, some few years ago, showed to the Photographic Society the practicability of obtaining large paper negatives from enlarged transparencies by simply printing the latter on plain or albumenized paper, and after fixing the prints, rendering them transparent in the ordinary manner. In this case the production of a large print meant the use of a large camera, or, at all events, of a large glass, to produce the transparencies. The new method entirely dispenses with this, besides which, an enlarged print, taken direct from the small negative, should be superior to one in which it is produced from an enlarged paper negative taken after three distinct operations.

Trying it on.—A gentleman, who is well known to the photographic world, lately poured out a grievance to us, and the grievance consisted in an attempt having been made to "interview" him. It appears that there are certain new applications of photography which he is experimenting on, and one day last week he was caught on the scene of his operations by a well-dressed being who began to insist on seeing what he was about. Our friend was very indignant, and demanded his name and occupation. Name ——; occupation, reporter!!! "I thought," said he, "perhaps you'd like a few paragraphs about yourself in different papers, and so on." Boiling over, our friend replied, that when he wanted puffs he always *did* his own, and wished him good-day. Well, we sympathise with our acquaintance a good deal, as it was not for our "At Home" that the interview was sought; but he is a little bit too particular, to our mind. We once had a similar *rencontre*, and we were *so* civil; but it very funnily resulted in the paragraphs describing gelatine as collodion, and some other absurdities, which, of course, we quickly contradicted; and thus we did in truth write our own puffs, much to the satisfaction of every one except the reporting chap. Rather hard on him, perhaps, though we guess it served him right. He has not been to see us any more. Perhaps he has turned his attention to happier hunting grounds, where pyroxylin and collodion are not the hares to chase.

The Radiograph.—One of the newest, and let us say one of the best, instruments that has lately been designed, has for its author a gentleman who was formerly well known in the columns of the Photographic News, Mr. D. Winstanley; and as it is an instrument which is indirectly photographic, perhaps it is worthy of the attention of our readers. The radiograph is intended to measure, quantitatively, the intensity of the sun's and sky's heat throughout the day, and perhaps longer still. At a meeting of the Philosophical Society of Manchester, Mr. Winstanley read a paper in which he describes it to a certain extent. The instrument is essentially a differential air-thermometer. There are two glass bulbs connected together by means of a bent tube, the bend being downwards, and where the bend is, there is introduced a column of mercury, which, when each bulb is equally warm, lies exactly central. The apparatus is balanced on a knife edge, and if one bulb is slightly warmer than the other, the mercury shifts along the tube, disturbing the equilibrium of the apparatus, but the balance is recovered by one bulb slightly falling from the level. Attached to the bulb is a wire which rubs against a smoke-black paper attached to a cylinder rotating by clock-work once every twenty-four hours. The track of the wire shows the extent to which the bulb rises and falls. One of the bulbs is blackened with lamp-black, and the other silvered, so that after the normal temperature of the air has been taken up, any heat from the sky or sun will have much greater effect on the one than on the other. We have seen some of the records of sunshine in such blackened strips, and very remarkable they are: every passing cloud leaves its track by showing depression, whilst before sunrise the heat reflected by the sky is clearly indicated. Sunshine, as a rule, means actinism, and by-and-bye, no doubt, the photographer who keeps a diary will add this simple instrument to his stock-in-trade, and keep the records of sunshine in as complete a manner as he does his accounts. This seems to us a decided improvement on the plan for registering sunshine instituted by Mr. Campbell, and which is at present at work at the Kew and Greenwich Observatories, and from which the records of sunshine which appear in the daily papers are taken. In the early form of the instrument, sunshine was indicated by the charring action of the sun's heat was focussed by a glass ball on to hemispherical bowls, such bowls being changed once every six months. In the newer form, the charring of strips of yellow card or black paper placed in a hemispherical ring indicates the amount of sunshine during each day, such strips being replaced daily. Comparing Mr. Winstanley's instrument with either of these, we have a decided advance, since the former gives an indication of the comparative amount of heat in sunshine, whilst the latter tells us only that there has been sunshine at certain hours in the day, but tells us nothing else.

At Home.

MR. BADEN PRITCHARD AT THE ROYAL ARSENAL, WOOLWICH.

The General Photographic Establishment of the War Department is a branch of the Chemical Department at the Woolwich Arsenal, and the Chemical Department may be described as the "guide, philosopher, and friend" of the Secretary of State for War. If a new explosive is invented—and they are invented every day, if we are to believe our morning papers—it is sent at once to the chemist of the War Department—Professor Abel, C.B.—whose duty it is to find out whether it will actually set the Thames on fire, as its sanguine promoter avows, or whether it is merely one of the thousand and one combinations of nitro-glycerine or gun-cotton which are continually being put before the public under a new name. The Chemical Department, with its staff of able war chemists, not only does this, but advises the Secretary of State upon all matters of scientific warfare, and in these days of electric torpedoes, water shells, steel battleships, machine guns, and submarine war vessels, there is obviously plenty to do on this score. Moreover, the war chemists act in the capacity of detectives. All stores that are purchased by the War Department are submitted to careful analysis before they are received and paid for. Oil, tallow, turpentine, lead, copper, beeswax, soap, candles, are all tested here before the contractor's bill is paid; the waterproof sheet upon which the soldier bivouacks, the cloth of which his uniform is made, even the amount of gilding upon his buttons, are examined by the skilful hands and watchful eyes of the war chemists. Nay, even the bread he eats and the water he drinks, the preserved meats, compressed soups, the dried vegetables supplied to the soldier, all come in for scrupulous examination.

The Photographic Establishment, under Mr. Baden Pritchard's direction, is a branch of this very important department. Its work is scarcely less useful, for to it is entrusted the recording of many valuable experiments on which much labour and money are spent. The establishment has its head-quarters at the Royal Arsenal, but there is an outlying station at the School of Gunnery, at Shoeburyness. As our readers know very well, it is at Shoeburyness that the War Office and Admiralty conduct their important experiments with guns and armour plates, the results of which experiments determine the strength of armour our battle ships shall carry, and the calibre of the guns with which they, as well as our coast batteries, shall be armed; it is the record of these experiments that falls to the lot of the military photographer, and at Shoeburyness there is to be found a serjeant photographer and a gunner assistant photographer, both belonging to the Royal Artillery. Staff-Serjeant George Thomas occupies at this moment the arduous post of principal photographer at Shoeburyness, and he is responsible for the due depiction by photography of all shot-marks against armoured targets, as also of the guns and projectiles concerned in the matter. There is no gainsaying a photographic record. Has the shot perforated a target made up with a twelve-inch wall of iron (to represent the bulwarks of an iron-clad), or has it not? the photograph tells us at once. One picture indicates the precise damage done to both iron and wood in front, and another picture shows us the injury worked from behind, while a third photograph represents the remains of shot or shell after this has done its duty. There are plenty of rival interests at stake, it must be remembered; there are the representatives of gun and of target, the maker of the projectile, and the manufacturer of the armour. But none can dispute the accurate record of the camera, and as soon as the negatives are taken at Shoebury, they are forwarded to the central department at Woolwich to be registered and printed. A new gun or a new shell is said perhaps to be more murderous in its results than any other; the matter is easily tested. A set of wooden dummies is put in position (representing so many infantry) and fired at; a photographic record of the "hits" is taken, and it then becomes an easy matter to settle the dispute.

At Woolwich we find, also, a military man in direct charge of affairs. Mr. Francis Dann, a sergeant-major of Artillery, and a Crimean veteran to boot, is here responsible for the due discharge of work, and this is of a very varied character. There are both landscape and portrait pictures to be taken, carbon, silver, and iron printing, and photo-lithographic and lithographic work. Mr. Dann tells you that for upwards of ten years carbon printing has been steadily carried on in the establishment, and all the more important records in the War Office are made in permanent pigments. The pictures for the most part measure twelve and ten inches, and of these more than 100,000 have been produced in carbon at the Woolwich establishment. The tissue is received weekly in large rolls from the Autotype Company ready sensitized, and the development is conducted upon zinc plates, planished and finely grained.

The mounting and finishing of the photographs (a mixture of gum and glue is employed) is placed under the charge of Mr. Bailey, while another assistant, Mr. Robert Vincent, has charge of the dark-room arrangements, and does much of the camera work. The printing devolves for the most part on Mr. Russell; but each and all of the staff must be competent to fulfil one duty or another. Indeed, there is probably no other photographic establishment in this country, unless it is the Chatham School, that affords to the assistants such an insight in the many branches of photographic work. Every new pattern in the service, whether it is gun, carriage, rifle, torpedo, saddle, harness, cooking utensil, tool, garment—all are photographed, and thus recorded. Some time ago a controversy arose as to the best kind of wheel for military carriages. More than a score of different patterns were manufactured, of iron, steel, wood, gun-metal, wood and iron, &c., &c. These pattern wheels were all "travelled" some three or four hundred miles over rough roads and smooth roads, across ploughed fields, and by hedge and ditch, and after they had been thus severely tested, photographs of the series were taken. The evidence of the pictures soon settled the question as to the wheel best adapted for rough military work; but the photographs will be retained for after-verification, in case, at some future time, schemers should be anxious to make trial again of wheels similar to those already tested.

Here is another series of pictures. There are one hundred and ten in this class. They represent modern "gun drill," with gunners grouped round heavy and light cannon. Here is one called, "Prepare for Action." A dozen men stand around a gun, each in his proper place; the men are numbered in artillery drill, and in the photograph the number is borne in every man's cap. Thus an instructor furnished with this photograph could indicate to the men their respective places on the command being given. Another picture is "Load;" the men have changed their places, and are in the act of loading. A third shows the proper grouping on the order "Fire," and so on.

There are also photographs of machinery and guns located in dark cells, pictures that could only be taken with the aid of mirrors, of which there are several—measuring a yard square—in the department. They are of cheap construction, made by Chappuis, of Regent Street, and the photographers at Woolwich seem to be able to wield them with considerable skill. The one point to be attended to in their use is never to fix them, as in this case there are always patches of light; if held in the hand, however, the reflection is more steady, and the result is then satisfactory.

Mr. Baden Pritchard has a very extensive collection of war pictures. Here are some from the Crimean War,

reproduced in carbon from faded silver prints, by the collodio-chloride process. They have been very successfully saved from the destruction of Time. One of them represents the Redan, as it was immediately after being taken; all here is in glorious confusion. Disabled guns are lying about, broken fascines, and torn sandbags are shown, and the whole scene betokens a hard struggle. Here is the Malakoff, with its shelter trenches; here Sebastopol Harbour, &c.

The China War of 1860 is represented by pictures of the Peiho Forts; we see the tops of the scaling ladders by means of which the place was taken by our troops; a dozen dead Chinamen are lying about, some old-hooped guns are in the foreground, and a clumsy crossbow is lying on the wall. Here is the Abyssinian War recorded; Zoulla Bay on the Red Sea, with the shipping and the railway; Senafe, our first inland depôt; Magdala, with the city gate, its church, King Theodore's palace—if we can call the huge mud hut by that name—and the captives that cost a million a-piece to liberate. Then comes a series of views of the Franco-German War, and of the Communist war that followed. It is strange to see a barricade erected across the *Place de la Concorde*, and another at the foot of the Column Vendôme, the column itself having been hurled from its pedestal. These pictures, too, have a melancholy interest. The portraits of Communists about these barricades sufficed to hang many a poor fellow afterwards, who rued the day when he had the temerity to stand proudly before the camera beside these earthworks.

A practical hint or two from Woolwich may be of service to our readers, and we, therefore, append from Mr. Dann's note-book the process adopted for the securing negatives of the faded Crimean prints to which we have alluded. This is likely to be of service to many, and is as follows:—

Collodio chloride gives a brown opaque non-actinic film, which, if submitted to the action of ammonia vapour previously to printing, darkens sufficiently to yield vigorous and brilliant impressions.

The faded prints, in regard to which it was difficult to decide whether they had been produced upon albumenized or plain paper, so advanced was the state of decay, were in the first instance thoroughly impregnated with wax (paraffine and stearine having been found to give a lesser degree of transparency). This operation was accomplished in the ordinary manner, care being taken to remove all superfluous wax by hot ironing, and subsequently rubbing the surface vigorously with a tuft of cotton wool. The waxing of the prints alone sufficed to deepen the contrast in the pictures; for whereas the yellowish whites were thus rendered more transparent, the half-tones and the shadows still retained their brown opaque character; and minor details which previously were quite invisible upon the surface became apparent.

The collodio-chloride was applied to a glass plate, coated in the first instance with a dilute aqueous solution of albumen, and dried; and when the collodion had set perfectly, it was placed before a clear fire, so as to become rapidly and thoroughly desiccated. The operation of fuming was then proceeded with, the stopper from a bottle containing strong liquor ammonia being simply removed, and the plate brought, part by part, over the orifice, until the bright varnished appearance of the film had become dulled and matt. This change in the aspect of the surface, which is brought about after the lapse of two or three minutes, indicates the completion of the process, and the plate, being again warmed, is placed in the printing frame upon the waxed positive, and the pad adjusted in the ordinary manner. Too much attention cannot be given in regard to the exclusion of moisture in this operation. The fuming should take place in a dry warm room; the pad and frames must be perfectly free from damp, and the printing operation itself is more safely conducted in a locality where a condensation of moisture need not be feared. If these precautions are not taken, and any damp should happen to penetrate to the negative, the formation of spots and stains upon the positive, as likewise upon the collodio-chloride image itself, is unavoidable, and a rare and valuable print may be in this way utterly destroyed.

In producing collodio-chloride pictures it has been stated to be almost impossible to over-print. This is perhaps going too far; but, nevertheless, a film of collodion may be printed very deeply indeed without detriment, especially when the same requires to be toned, in which operation a very great deal of the density is lost.

In the present instance no toning whatever is necessary, but development, or rather intensification, is resorted to for the attainment of greater vigour. After flowing sparingly with water to cause the solution to pass freely and uniformly over the surface, an intensifier, made up according to the formula of Messrs. Mawson and Swan (who also supplied the collodio-chloride), is employed, viz.:—

Gallic acid...	75 grains
Glacial acetic acid	2 drachms
Acetate of lead	50 grains
Distilled water	20 ounces

filtered or decanted previous to use.

A little silver is added to the intensifier where very great vigour is required, the working up of the plate being gradually carried on until sufficient density has been attained, the operation being of course conducted in the dark room. Fixing with an ordinary hyposulphite solution follows.

When the film has been dried and varnished, no further fear need be entertained of its being deliquescent, the subsequent handling with the intensifier, and washing with water, having dissolved out all compounds of a soluble character, and the varnish, moreover, affording considerable protection. According to actual experience, a large number of prints may be pulled off without any appreciable deterioration of the plates.

The next "At Home" will be "Mr. Valentine Blanchard in Regent Street."

ON A PROCESS FOR PRINTING BY DEVELOPMENT

BY CAPTAIN ABNEY, R.E., F.R.S.*

Prints on Albumenized Paper.—To adapt this process to albumenized paper is not a hard matter, and may be carried out in two ways. Ordinary albumenized paper may be used if desired.

It is advisable to have a greater proportion of bromide than iodide, and the following proportions may be employed:—

Potassium bromide	500 grains
Potassium iodide	150 „
Distilled water	20 ounces

A sheet of albumenized paper is first sensitized in the ordinary manner to coagulate the albumen, and then washed in a couple of changes of water. It is next immersed in the above solution, as in the first process, and allowed to soak well for the specified time. It is then carefully lifted out and placed, back down, on a sheet of blotting-paper, and with a tuft of cotton wool all superfluous moisture is soaked up from the albumenized surface. The silver chloride in the paper is converted into silver iodide by the potassium iodide, and the albumen imbibes the soluble bromide, iodide, and chloride subsequently. The manipulations for development are exactly similar to those already described, excepting that the developer may be used of full strength, and with considerably less bromide. Another mode of preparation is to impregnate liquid albumen with the soluble salts.

* Continued from page 119.

The formula stands thus :—

Ammonium bromide ...	... 60 to 120 grains
Potassium iodide ...	... 120 to 60 ,,
Spirits of wine ...	... ½ ounce
* {Albumen (dried) ...	... 500 grains
{Water	... 10 ounces

The usual operations are now performed, and the paper is hung up and dried. It might happen that the iodine acts upon the albumen, for which reason it is omitted. The sensitizing and developing operations are conducted as before.

In both these methods the print will be very much more upon the surface than in the ordinary plain paper prints described above.

I have tried soaking the paper, after the first wash-water after sensitizing, in a 10-grain solution of sodium chloride, and again re-washing. It diminishes the sensitiveness slightly, but not seriously, and the whole of the silver salt is thus in combination with a chloride, and with no organic salt. For keeping purposes this is decidedly an advantage, but is not necessary if the paper is to be used shortly after sensitizing.

Gelatinized Paper Prints.—My first attempts were made with gelatine emulsion spread on paper, either by floating or by coating paper with it, holding the paper on a glass plate. I need not detail my many failures—suffice it to say that an emulsion is not so suitable as the method I am about to give. I have by me a quantity of gelatinized paper prepared for photo-lithography, and this I impregnate by floating the gelatine surface on a solution of—

Ammonium bromide ...	... 120 grains
Potassium iodide... ...	... 60 ,,
Water	... 10 ounces

Iodine, enough to colour the liquid a claret colour.

The paper is floated on this till the iodine appears through the back of the paper, and all superfluous moisture is avoided by passing the case over the surface of the dish, or by means of a glass rod. It is then hung up to drain, and when nearly dry, or dry, which it takes some time to do, it is floated on the sensitizing bath, till the iodine at the back of the paper has disappeared. It is then well washed (or, if required to be kept, is treated with a bath of sodium chloride and again washed), and allowed to dry. It can then be developed in the same way as indicated for the albumenized paper.

I have not tried impregnating a gelatine solution with the haloid salts and floating paper upon it, but there seems no reason that it should not succeed, provided always that so much of them be not added as to cause a marked crystallization in the film, as is the case when glass plates are employed for receiving the film. It should be remarked, however, that, as occurs in the collodio-chloride process, though much difficulty is experienced when using the original formula given by Mr. Simpson to prevent crystallization when employing glass, but when using paper as a support, the defect is hardly apparent. The same would probably occur with the gelatine. In fact, when coating paper with ordinary unwashed gelatine emulsion, the crystallization which would inevitably appear in it on a glass plate is absent.

It may be asked why iodide is used at all in the process. There are two reasons for it ;—1st. That the light in which the development can take place is the ordinary yellow light of the developing rooms, and a good light is necessary when developing a print ; 2nd. For the plain paper process the iodide, being unreducible by the developer, breaks the continuity of the bromide, and prevents fog by the reduction of the particles of bromide not separated by the pores of the paper, which separation is effected without the iodide when albumen or gelatine is used. If paper negatives ever come to the fore again, the iodide may be totally omitted from the formula for albumenized and gelatinized papers, and great rapidity may be obtained.

I may state that development with the ordinary alkaline developer is out of the question, since we get stains which are not removable by any method of which I am aware which will not also destroy the image itself.

Addendum.

Since the above paper was written I have made a few more experiments, by which I find that paper can be very well floated on a gelatine solution impregnated with the bromo-iodizing salts.

The following formula answers well :—

Nelson's fine cut gelatine... ...	½ ounce
Potassium iodide ...	... 100 grains
Ammonium bromide ...	... 200 ,,
Water	... 10 ounces

The gelatine is swelled in the water to which the salts have been added, and then dissolved by the aid of heat. The solution is strained through flannel, or through cotton wool, and poured into a dish. (The temperature of the liquid may be kept up by placing the dish over a water-bath.) The paper is floated for three minutes on it, and hung up to dry by two corners. When dried it is floated once more for the same time, and again hung up, but by opposite corners to those by which it was first suspended. The paper is then ready for sensitizing, which is effected by floating on the silver solution already given. The prints on the gelatinized paper are very beautiful if care be taken ; and they furnish a deep black tone. The gelatine should be colourless, and not of that yellow class which is so frequently to be met with.

I have obtained very good photographs of the solar and iron spectra on all of the above papers, and I am sorry to say that where the bromide is decidedly in excess of the iodide in the salting solutions, I find that the silver compound is sensitive to yellow light, and even slightly the red. If the iodide be in excess of the bromide this is not the case—the paper is then only impressionable by the same rays as the ordinary wet plate. Those, therefore, who try the process, and have to develop in the ordinary light used for wet plates, should keep the proportion of bromide to iodide given in the first formula for plain paper.

Another point I wish to call attention to is this, that rapid development means a dull image, which is caused by its becoming buried, as it were, in the paper itself. If plenty of bromide be used the development will be slow, and the image will remain and gather strength on the surface. With quick development the whole of the silver salts which have been acted upon by light get reduced at the first application of the developer ; but with slow development the silver compound on the surface is first reduced, and the image is built up from beneath, as it were, on this first reduced silver. The tone, too, of a slowly developed print is always more agreeable than where the development has been hurried. If the strong developer be employed, it need scarcely be said that a shorter exposure is necessary to attain this end.

A great variation in colour is obtainable by these processes. Thus the more iodide used the blacker is the tone, and, as the bromide is increased, the bistre colour is more common. Again, if the paper be not immersed in the common salt solution, and if fixing precedes the use of the hydrochloric acid, the resulting tone is much browner than if the hydrochloric acid be used between development and fixing. This may be accounted for by the fact that organic salts of silver when exposed to light are acted upon by the developer, and the compound salt after fixing is much more stable than that which is found after development. Prints can be toned with the lime-toning bath, and give fairly good tones. Thus much modification will be made by the operator.

* For this the whites of ten eggs may be substituted, and gives a much better gloss.

PHOTOGRAPHY AND COLOUR, FOR EDUCATIONAL AND TECHNICAL PURPOSES.

BY T. J. PEARSALL, F.C.S.*

When the subjects of photography and colours are seriously named there seems to be one pervading idea to express in some way the fervent hope and belief that Nature may some day portray her own scenes with her own colours. Philosophic men have become so fully possessed of this idea that they readily follow on to other conditions :—How will such pictures look? Will they be artistic? Will they please? Will they be sharp, hard, or soft in appearance? Will they fade? Not to venture on such topics now, but to call attention to the representations we have, and the colours we have ready for use in the simplest manner, is the object of the present remarks.

It is also right to say there are many persons so devoted to photography pure and simple that they can scarcely hear of or discuss the question of colours applied to photography, and certainly many photographs have been too obvious by their public display of gaudy colouring. Some persons think a photograph is spoiled if coloured, and probably a new style has yet to be devised that may show what the photograph really is, and what the colour attempts to effect. We may readily admit that colours applied to a photograph may produce a very mixed picture when some of the colours are opaque, and thus hiding the photograph; but if the colours are sufficiently transparent, then the colouring and the tones of the photograph may so blend as to yield a truthful and pleasing picture. As to the modes of imparting colour and the difficulties that beset the colouring of photographs encountered by the amateur, I shall not enter, my immediate purpose being very different. The title of the subject I sent was "On Colour as applied to Photography for Educational Purposes."

Let us consider a photograph. It represents very truly all the shapes and details of objects in due proportion—every line and every angle, the play of light and shade, the relative position of objects one to another—with perfect exactness and perspective; and while they are well shown, all nicety of detail and all indications of structure are given with wondrous perfection. But how will they be depicted by the photographer? The means he employs produce light and shade only; but as most of the objects are well known—say portraits or landscapes and the like—the mind at once accepts them, giving unconsciously a sort of sufficient tint or colouring by the imagination. But the moment a new subject is represented—any one of the myriads of creatures of the animal world or some work of skill produced by man—we are quite at a loss as to the qualities of colour beyond the geometry of form and the play of light and shade, and we have to remain satisfied with the fact of transparency being faithfully indicated, or the surfaces of a solid being shown as plain or rough.

The photographer, according to his wont, uses the chemicals that suit his notions or the fashionable tint of the day. The lights and shades may be some shades of bluish-violet, some foxy or chestnut brown, some umber-like or muddy tint, toned to treacle tint or blackness, and the very depths of carbon itself. Some prefer the silver or steel blue-grey of platina; in other words, in the result you cannot tell whether the tone represented is white, red, or black in Nature. All the beauty of butterflies, flowers, fruit, beetles, or birds is shown only by these chemical neutral tints. Now, it has appeared to me that, for the purposes of education and reference, some addition of colour might be made to distinguish, say, chalk from cheese or wood from stone.

There is a great and proper objection to the reception as evidence of a photograph with colours upon it with the handiwork of an artist, Nature being interfered with and, to some extent, hidden. What I propose is that, where the quality of colour is required to show the effects of colour unobtrusively by the action of light, or, rather, the double action of light, the pure photograph should be seen, as it usually is at present, by light reflected on it from its face. Then, when colour is required to be seen, the spaces occupied with true colour are to be shown by shutting off or shading off the light on the front, and letting in light from the back to be transmitted through the proper colours to the eye. Crudely and shortly stated, it may be said that a photograph painted on its back, when held up to the light, may show both the photograph and colours. It may also be stated that colours have been applied at the back long ago, and I may add that they have heightened usual pictorial effects, and, indeed, of late years, there have been produced satisfactory results of blending or diffused softness by simple means.

But it is not of such well-known arrangements with which I wish to deal, but to set forth that a more truthful copy of Nature is wanted than the mere light and shades of photography. I think that some of the desired qualities can be instantly shown, added to the faithful photograph, and in this way giving a more truthful representation of Nature, affording what the child, the philosopher, the skilled workman, and the judicial mind absolutely insist upon, and which the pupil and the teacher require and carefully appreciate. If it be a shell, a butterfly, or a flower, all the form and surface are well shown, and now by simple means gorgeous colours can be indicated.

Keeping to the severity of legal evidence, where common colour is added to the photograph and interferes with Nature's own portraying, I may refer to some examples. Suppose we take photographs of a mass of minerals. If of granite, we cannot tell whether they are black, greenish, brown, red, or yellow; but if looked at when colours are transmitted with light to the eye from the back of the photograph the distinctions are obvious. Another example is perhaps yet more to the point. A mass of minerals, very finely crystallised—say of fluor spars: but they may be white, yellow, green, blue, amythistine, or purple, semi-transparent or opaque, and here colours shown by transmitted light very usefully come to aid us.

I have great satisfaction in saying that Professor Tennant kindly favoured me with minerals from his collection and the cabinets in King's College, and he pronounces the representations as being a most effective advance on all the means for illustrating such subjects. Had time and the weather allowed I should have been glad to have extended these illustrations to various gems and objects.

It is obvious that similar means of giving the aid of local colours may be employed with drawings and engravings, and I think that the medical and surgical professions may here find a true method of indicating stages of disease and injury which they may value.

The plans of giving colour at the back or by transmitted light may be varied, and sufficiently gratifying effects may be produced by very simple means. Here, for instance, we may have a sculptured head, the work of a skilful, truthful, but unknown artist of ancient days, exhibiting sweetness and natural character. The contour and the play of form of light and shade are truly shown; but what is the material of the bust? The practised eye very soon concludes it is of metal, and not clay, marble, or stone. Metal it may be, but is it iron, lead, silver, brass, copper, or bronze? Yet the mind asks to be satisfied further, whether it is golden brass or green, having a beautiful covering of blue and green carbonates of copper, or verdigris, so often seen on the metal works of antiquity; or is it red, or the olive, almost black, that alloys or bronzes show in the many fine works of the ancients and moderns? Even the simple device of placing a screen of tinted paper will show at once that this gives a sort of complexion that the mind of the beholder accepts, and he very speedily completes a pictorial representation.

(To be continued.)

* A communication to the South London Photographic Society.

The Photographic News.

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PHOTOGRAPHY IN SIBERIA.

A Lecture on "Round the World, illustrated by Photographs," is decidedly a novelty, and we may congratulate the members of the Photographic Society upon a very successful evening on Tuesday last. The lecturer was the Rev. Henry Lansdell, F.R.G.S., and in a modest, unaffected manner he gave a pleasant account of his travels, the most arduous part of which was his journey from St. Petersburg, over the Ural Mountains, and across the dreary wastes of Siberia to the Chinese coast. It had been Mr. Lansdell's intention to take with him a small camera and a supply of dry plates, in order to secure pictures of towns and their inhabitants; but, fortunately for himself, he did not do so. The camera and sensitive films he imagined might possibly serve to show the benighted inhabitants of the districts how much more enlightened in matters of science and art were the Western nations, but Mr. Lansdell soon found that instead of being able to teach Siberia photography, that country was competent to read the traveller a very good lesson upon that subject.

Mr. Lansdell exhibited on two screens a very fine collection of photographs that he had secured during his long journey, always keeping straight on, as the President of the Society remarked, until he came back to his native land once more, by crossing the ocean to San Francisco and returning across the Atlantic. One of Mr. Lansdell's objects was to visit the prisons of Siberia, and to write an account of the country and its inhabitants, and this task he hoped to fulfil in a great measure with the aid of photography. Indeed the prints he has collected are so many pictorial notes, and Mr. Lansdell is probably the first traveller who has taken such advantage of photography.

Siberia and China, as Mr. Lansdell proved to his audience, are replete with magnificent scenery. Switzerland and the Tyrol suffered in comparison, the lecturer said, in many districts, and he was able to point on the walls to photographs to bear out this assertion. Again, the park-like scenery of Old England, with its stately trees, green-shadowed glades, and undulating woodlands was to be seen in duplicate near the Pacific coast of Siberia. The costumes of the people were vividly portrayed in Mr. Lansdell's photographs; and the lecturer afforded the rare instance of a traveller telling strange stories, and illustrating them by photography. As to Mr. Lansdell's statement that instead of being able to astonish Siberia on the subject of photography, that country considerably astonished him, we may say that some of the examples of portraiture he has brought back with him are really exceedingly fine. Everybody knows that St. Petersburg and Moscow count portrait photographers of European fame, but few will be prepared to hear that in some of the towns in Siberia photographic portraiture is on a level with that of London and Paris.

TOPIC OF THE WEEK.

"Modern Photo-lithography," by Mr. Henry Butter, is unavoidably postponed till next week.

Notes.

Of all the applications of the electric light that have yet been hit upon, perhaps that upon which Dr. Siemens lectured to the Royal Society last week is the most remarkable. It is well enough known that plants kept entirely in the dark die soon for the most part. Dr. Siemens has carried out an extensive series of experiments which go to prove that plants exposed to sunlight in the day and to the electric light at night thrive and flourish far better and faster than those which have daylight only. To illustrate this, Dr. Siemens exhibited to his audience a pot of tulips in bud, which the electric light brought into full bloom in some three-quarters of an hour.

British opticians have seemingly to pay dearly for their reputation. Mr. Dallmeyer tells us of a most impudent forgery of his name to a cheap lens, which was thereby converted apparently into one of his well-known No. 1 B's. In all doubtful cases we recommend our readers to apply to the original makers, who have more at stake, it must be remembered, than the intending purchaser, and are willing, therefore, always to give information.

In distributing the prizes to the Nottingham School of Art, Sir Coutts Lindsay, who, our readers may know, has a keen appreciation of photography, and was one of the late Mr. Rejlander's best friends, advised students to take up some special branch of art, and deprecated the English system of allowing pupils to have their liberty too soon; the one golden rule for art-students was, that they should be dissatisfied with their work so long as they thought it possible to do better.

We regret to hear that Madame Niépce de St. Victor is in straitened circumstances, and Messrs. Lombardi and Co., of London and Brighton, have kindly undertaken to start a subscription list on her behalf, provided Her Majesty the Queen will give her patronage. The late M. Niépce de St. Victor was one of the first, if not the first, to employ albumenized glass for negatives, and shared with Becquérel the honour of being the only photographer who has reproduced images in their original colours in the camera. His camera-pictures of dolls attired in coloured raiment were exhibited to the members of the Photographic Society in February, 1872, exactly eight years after their production.

Some forgeries of £5 notes of the Sheffield and Hallamshire Bank have recently come to light, in which there is little doubt photography has played a part. When we know that in Paris little difficulty has been found in reproducing the blue notes of the Bank of France, one can feel but little surprise upon the subject, and since the colouring applied afterwards does much to cover up defects in the forgery, we have grave doubts as to pigments being any safeguard at all. Indeed, to our mind, it facilitates, in many cases, the work of the forger.

In the *Naturforscher* Dr. Theodor Gross announces that he has brought to a conclusion a series of experiments which, as he believes, tend to show that sulphur must also be removed from the list of elementary substances. This announcement, coming so close on the publication of Lockyer's views, and on Dr. Meyer's alleged discovery of the dissociation of chlorine, proves how eagerly chemists and physicists are working in the direction of reducing the number of the elements. Dr. Gross adds that he has also reason for thinking that phosphorus will give similar results when treated in the same way as he has treated sulphur.

On the Continent they are talking about manufacturing gelatino-bromide films in thin sheets, like that employed for cracker bonbons. It is to be sold and employed without any backing of glass, and only upon development are measures to be taken to fix it upon a temporary basis of this material. Here is welcome news to travelling photographers generally, and to the tourist in particular.

One would hardly connect the innocuous camera with the death-dealing torpedo of modern invention, and yet, strange to say, the camera played a very important part in the very first system of electric and gun-cotton torpedo warfare that was devised. This was at the defence of Venice in 1859. At a prominent spot overlooking the harbour, was built a camera obscura ; this camera obscura reflected the waters of Venice upon a large white table, and every movement upon their placid surface was visible in the picture to those watching within. Some heavy charges of gun-cotton, which were to constitute the torpedoes, were now sunk in different parts of the harbour, each case of gun-cotton having attached to it electric wires, which led to the shore. The torpedoes were numbered consecutively, and the wires attached to them brought up into the camera obscura. As one charge after another was sunk, a sentinel in the camera watched the operation, and made a pencil mark on the camera table, at the spot where the torpedo disappeared. A row-boat in the harbour described a circle round the sunken torpedo, to indicate the zone of its destructiveness; and the sentinel watching this boat, made a corresponding little circle with his pencil in the picture on the camera table. In the end, therefore, was to be seen in the camera obscura a picture, or map, of the harbour, together with a number of little circles, each numbered to indicate where torpedoes were sunk. Moreover, at hand were a bundle of electric wires leading to the several torpedoes, which were thus placed under the control of the sentinel. His duty was to watch the approach of a hostile vessel, and so soon as he saw it get within one of the circles marked in the picture, he would proceed at once to explode the particular torpedo by means of its particular electric wire. This torpedo system is worthy of record, if for the fact alone that it combined for the first time electric science, gun-cotton (a modern explosive), and the new art of photography. The system had obviously one drawback, it could only be employed in the daytime, when the camera picture was visible.

We are glad to announce that Mr. William Bedford and Mr. Peter Mawdsley will shortly contribute a "Topic" of interest to these columns.

There is a glycerine thermometer now at Kew with a column of liquid twenty-seven feet high. A variation in temperature, which would make the ordinary mercury thermometer rise one-tenth of an inch, makes the glycerine thermometer rise to the extent of one inch. The great value of glycerine in this connection is the fact that it does not boil till 440° F., while its freezing point is much below that of water.

Indeed, the indisposition for glycerine to freeze is a fact worth bearing in mind. Liquids in hydraulic pumps or jacks, in electric batteries, and similar apparatus, may be secured from freezing to a great extent by admixture with glycerine.

The invention of new photometers—or, more properly speaking, actinometers—is certainly the order of the day. Very recently Dr. Eder suggested the use of oxalate of mercury for determining the intensity of the ultra-violet rays of daylight. He prepares a mixture of mercuric chloride and ammonium oxalate; when this is acted on by light the mercurial salt is reduced, and mercurous chloride is precipitated. By the quantity of this latter salt thrown down, the intensity of the action of the light is estimated.

Quite on a different principle is the torsion photometer invented by Professor Zöllner. This instrument is a special form of the radiometer. It consists of a four-armed fan, suspended in a partial vacuum by means of a spider's or cocoon thread, each arm bearing a vertical plate of mica, blackened on one side. On the top of the glass case of this radiometer is a horizontal paper scale divided into degrees, by which the torsion of the thread, produced by the action of light on the radiometer, is estimated Naturally, the apparatus must not be exposed in too strong a light, or the torsion will exceed 360°.

The Army Clothing Factory, instead of despatching a pattern tunic to the master tailors of every regiment in the service when alterations in facings or cutting are to be carried out, now adopt the simple expedient of merely furnishing commanding officers with photographs of the new garment.

What is called a "Universal Advertising Machine" has recently been patented in Berlin. In appearance it resembles a wooden box, about twelve by ten, with a glass plate in front on which the advertisement is made to appear for a few seconds, and then disappear again to make room for another. It will be seen that the apparatus is of a size to place in a shop-window, and the constant change of the placard behind the plate is calculated to attract the attention of passers-by. The advertisements themselves may be photographs or any other form of print.

WHAT IS AN ARTISTIC PHOTOGRAPH?

BY E. DUNMORE.*

There are probably few present this evening but consider themselves fully competent to answer this question—*What is an Artistic Photograph?* and equally ready to explain that good composition and a proper balance of light and shade are the principal qualities necessary to its existence. Quite true, this is so; but the difficulty lies in this (with those who have not gone through the regular routine of an art education)—in defining what is good composition and what is a proper balance of light and shade. Rules, I know, we have for our guidance founded upon the best examples of art and correct optical laws that cannot be neglected by any one whose aim is the production of artistic work. If they are disregarded, the result is an abortion and a caricature of art. Rules may be, however, but partially and imperfectly understood, and consequently not complied with, for in the application of rules the difficulty lies, or they may be followed by the photographer without his being conscious of the fact. In either case the result is somewhat hap-hazard, and pictures taken under such conditions are very unequal in artistic qualities, even when they possess them. However, I will not pretend to teach a subject upon which so many of my audience are much better imformed than I am myself, but merely call attention to what is certainly one of the special difficulties of photography with the average of photographers.

One question, however, I will put to you, and one that you perhaps will mentally retain and answer at your leisure. It is this:—Supposing that a thoroughly-good picture—one with which you had no previous acquaintance whatever—was placed before you, and you were requested to point out its good qualities in concise and intelligible language, where it excelled and why it excelled, and what particular rules had been specially observed in its formation, should you be able to do so accurately and in words that would convey an unmistakable meaning? I am afraid it would be difficult to many and impossible to some, and you would feel that to put impressions into words a more difficult task than you had expected. So much is the difficulty understood and tacitly acknowledged that many good photographers who have not passed an apprenticeship to art—that is, graduated in schools devoted to art purposes, more especially of draughtsmanship and painting—make pictures from an intuitive perception of what is right and beautiful, but would be exceedingly puzzled to explain why they did this or why they did the other.

It is sufficiently easy to deal in generalities and get posted up in art-slang, and yet know nothing about art, as the ludicrous mistakes occasionally made by the misapplication of art-terms that may be within the knowledge of many of us prove. Of course it is a gross exaggeration when, in the comedy of *Pygmalion and Galatea*, Crœsus is made to criticise the statue of Galatea by observing that it was deficient in light and shade and the scumbling imperfect. Still, without going to such extremes, the misapplication of terms is anything but of infrequent occurrence. Whatever aptitude may be attained in flinging about conventional phrases, the position to which I have just alluded, and hypothetically placed before you, would compel many to confess that they were unable to satisfy themselves, whatever they did other people.

You may admire one picture more than another of a similar character without, perhaps, being able to account for your preference, but that the one seems to speak to you in more forcible language of the truth and beauties of nature in a manner more easily comprehended. It tells its tale silently but more clearly and in more pleasant words, and so, without knowing how the technical phrases of art criticisms will apply, your own intuitive perceptions enable you to make a right choice.

These remarks suggested themselves to me upon reading an essay by a well-known art-critic, and I cannot help but think that the light thrown upon a subject by a clever, detailed, and explanatory criticism of the utmost value, and goes to prove how very difficult it is for those not educated up to it to clearly comprehend or give an approximately fair criticism on skilful productions of either the chisel, the pencil, or the brush, and, shall I say, the camera? A true appreciation of art prevents the bad and meretricious being taken for the good; but it is quite another matter to make an accurate analysis and clothe criticisms in words easily understood and comprehended by photographers generally.

I would earnestly recommend the careful perusal of such works as those of Ruskin and Hamerton as of great assistance in helping the photographer out of this difficulty, and much good may be gained by the systematic reading of works by acknowledged teachers of art, together with the frequent study of good pictures. I do not mean walking through a picture gallery up one side and down the other, getting very little besides a headache for your pains, but a long and deliberate study of some good picture until you see and understand the why and wherefore of the disposition of its lines and the arrangements of its lights and shadows. One hour's intelligent study of this kind will be of greater benefit than months of the usual cursory examinations, and I cannot too strongly recommend photographers to devote some portion of their time to a self-education of this character. Depend upon it, the time thus devoted will not be thrown away. Here in London especially, there are innumerable opportunities for doing so, and in most country towns facilities for art study are tolerably plentiful and, I am glad to see, on the increase. The wonderful improvement in form and design of the thousand-and-one articles for domestic use or decoration that has of late years become so apparent is entirely owing to the more careful study of art by those employed in their manufacture, and the same improvement will take place in our photographs if the makers of them will only follow the same track.

(To be continued.)

* A communication to the South London Photographic Society.

Correspondence.

BRISTOL PHOTOGRAPHIC INTERNATIONAL EXHIBITION.

Dear Sir,—As there seems to be some little misunderstanding in the minds of a few professionals, allow me to state what I believe the greater part of the community know, viz., that the above Exhibition will be on a large scale, and *open to the photographic world generally, amateur and professional.*—Yours truly, H. A. H. Daniel, *Hon. Sec.*

THE GLASS ROOM.

Dear Sir,—Would you be kind enough to insert this question in the News?

"At what angle should a glass roof for studio, facing north, be built to exclude the noonday sun at midsummer, and what are the objections, if any, to having the light at such an angle?"—Yours truly,

W. Salmon.

PRINTING BY DEVELOPMENT.

Dear Sir,—On reading Captain Abney's paper on a process for printing by development, I find the formula given for the sensitizing solution:—

Silver nitrate	... 500 grains
Glacial acetic acid ...	... 1 ounce
Distilled water	... 2 ounces

I am inclined to think this must be a mistake, as 16 or 20 ounces of water will be found none too much for 500 grains of silver, and more in harmony with the strength of the salting solution; then there will be much less excess of silver to remove in the washing of the paper.—Yours truly,

Sydney Smyth.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE monthly meeting of this Society was held on Tuesday, at 5A, Pall Mall East, the President, JAMES GLAISHER, Esq., F.R.S., in the chair.

Capt. HERBERT KERR was elected a member of the Society.

Mr. SPILLER said it would be in the recollection of the members that a number of specimens of the platinotype process had been shown at the last Exhibition of the Society. Since then he had had the opportunity of testing the permanence of those platinotype prints, and the results he desired to lay before the meeting that evening. The four specimens he had brought with him had successively been submitted to the action of strong hydrochloric acid, to nitric acid, and to aqua regia, without showing any signs of disturbance. The prints were then washed in bromine water, subsequently in ammonia, and finally subjected to sulphide of ammonium, but in each case they remained unaffected. From first to last he could find no evidence of deterioration. Dr. Monckhoven had asserted that platinotype prints were injuriously affected by sulphur and chlorine, but, so far as his experience went, he could not coincide with this opinion.

Mr. BOLTON then exhibited a photograph taken by Mr. A. P. Henderson by moonlight on a gelatine negative. The exposure lasted from 9 o'clock p.m. to 4 a.m.

The Rev. H. LANSDELL, F.R.G.S., delivered a very interesting address descriptive of a tour made last year in Siberia. Mr. Lansdell's object in taking the journey was more particularly to visit the prisons, at each of which he was enabled to leave a Bible or a Testament. He had also made a valuable collection of Russian photographs, and these, together with a very large number of photographs of a similar kind contributed by Mr. Warnerke, were hung upon the walls of the room, and excited considerable interest. In the course of his remarks, Mr. Lansdell referred to the universality of photography, inasmuch as he found the art to be known and practised extensively even in the far-off regions of Siberia. With regard to Russian photography generally, he believed that while English photographers bore away the palm in landscape and in matters of photographic science, the Russians were ahead so far as portraiture was concerned. The photographers of St. Petersburg—Levitsky, Bergamasco, and Denier—were well known for the excellence of their work, and there were also some exceedingly clever artists at Moscow. With regard to photography in the Russian prisons, they did not, so far as his observation went, photograph every prisoner, as the number who escaped every year was very large, amounting, in 1876, to as many as 972. Among other photographs of scenery, and of the various people he visited, Mr. Lansdell exhibited some which showed prisoners loaded with chains. He had found that of all countries he had visited, Finland was the worst in respect to the weight of these chains, which, in many cases, amounted to not less than a hundred pounds weight for each prisoner. On Mr. Lansdell's arrival at Irkutsh, of which town he gave a very interesting description, he found the place on fire, and he was witness of a conflagration which extended nearly a mile in length, and comprised in area nearly half a square mile of flame. After a description of Lake Baikal, and the river Amom, Mr. Lansdell passed on to speak of Kiacta, a town unique in its way, as the only town in the world without women. Mr. Lansdell had a dinner given to him comprising thirty dishes, all of which he tasted. In speaking of the treatment which prisoners received in the mines of Siberia, Mr. Lansdell gave it as his opinion that the accounts which had been published had greatly exaggerated the truth. So far as he was able to ascertain by personal observation, and from inquiry of the prisoners themselves, he could not find that there had been anything like the ill-treatment generally believed. The prisoners in the mines were certainly better off than the free labourers, and as to being kept continually underground, this was an error, as the mines in Siberia were worked from the surface. Mr. Lansdell, in conclusion, described the scenery of the river Amour, Saghalien, and the remainder of his journey, *via* San Francisco and New York, home.

A vote of thanks was proposed to Mr. Lansdell by Mr. Seebohm, who had been referred to in the paper as one who had engaged in some important travels in Northern Siberia in connection with the study of ornithology.

After a few remarks from the President the vote of thanks was unanimously carried, and acknowledged by Mr. Lansdell.

A paper by Captain ABNEY on "Lateral Spreading of the Image during Alkaline Development" was, on account of the lateness of the hour, taken as read.

Mr. WEAVER, of Runcorn, then exhibited a new instantaneous shutter by means of which bicycles in motion, vessels sailing, and horses trotting could be taken. This shutter consisted of two diaphragms in front of the lens, and by a mechanical arrangement resembling the action of a hair-trigger, these were made to open from the centre of the lens, and close again almost immediately.

The PRESIDENT having announced that the collection of photographs now on the walls would be removed after the meeting, and that photographs of any kind for exhibition at the next meeting would be gladly welcomed, the proceedings terminated.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on Thursday, March 4th, at the Society of Arts, Adelphi, Mr. P. MAWDSLEY, Vice-President, in the chair.

After the minutes of the last meeting had been read and confirmed, Mr. C. Poirson was elected a member.

The SECRETARY then read a letter from the President, stating his inability to attend through illness. A letter was also read from Mrs. Simpson, thanking the members of the Society for their expression of sympathy carried in a resolution at the last meeting on the death of Mr. G. Wharton Simpson.

Mr. T. J. PEARSALL, F.C.S., then read a paper on "Colour Applied to Photography for Educational and Technical Purposes" (see page 125), and exhibited several specimens in illustration.

Mr. EDWIN COCKING remarked that the dark parts of the specimens were not equally as good as the bright parts. This, of course, arose from the opacity of the metallic deposit on the print, and until this was obviated they would lose the transparency of colour in shade which was as valuable as the stronger pure colour.

Mr. F. HOWARD said that for educating the young Mr. Pearsall's method would be very useful as conveying a correct idea of what it was desired they should know.

Mr. PEARSALL thought, for technical points of law, it was essentially useful, as there was the faultless truth of photography combined with the true colour.

After a vote of thanks had been passed to Mr. Pearsall,

Mr. E. DUNMORE read a paper on "What is an Artistic Photograph?" (see page 128).

Mr. COCKING said that the study of the elementary principles of art must form part of the future study of the rising generation of photographers. It was a most difficult matter to set about, as, besides art, there was also a science to be studied; at the same time, whilst there existed, however small, a latent feeling for art, the study of principles as guides would be found to be easily acquired.

Mr. W. COBB thought the Society would reap great benefit from the question of art being continually brought before the meetings.

Mr. FRANK HOWARD recommended landscape photographers to read a publication by a namesake of his, entitled "The Sketcher's Manual," as being very useful.

After Messrs. B. J. Edwards and W. Brooks had promised papers for the next meeting, and the usual votes of thanks passed,

The CHAIRMAN announced that the President had chosen as the subject for the March Monthly Competition, "A Merry Party," also that an envelope must be sent with each picture, containing the name and address of sender; would members bear that in mind? Last month's pictures were exhibited on the black board for the inspection of members, and created great interest.

The meeting then adjourned to April 1st.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting of this Society was held at the usual place, the Museum, Queen's Road, on Wednesday, 3rd inst., Mr. RADCLIFFE in the chair.

The minutes having been read and confirmed, Messrs. Stoate, of Bridgwater, and A. Levy, of Bristol, were elected ordinary members.

Mr. H. A. H. DANIEL said he had an important piece of business to bring before the meeting, of which due notice had been given, viz., the election of a Vice-President to fill the vacancy caused by the retirement of Mr. P. J. Worsley. As the impor-

tant and numerous city and county engagements prevented their esteemed and valued President from often being present, and ill-health deprived their remaining Vice-President of the ability to be present at their evening meetings, it was felt by the Council that the vacancy should, if possible, be filled by one who could generally be present, and who was, at the same time, an energetic worker. Both these qualities were undoubtedly found in their esteemed friend and member, Mr. T. Davey; he was younger in the art and younger in the Association than some of them, but he quite made up in devotion alike to the study and to the interests of the Association. The speaker knew that nothing possible to set aside had stood in the way of Mr. Davey's attending the meetings; he (Mr. Daniel), therefore, had much pleasure in proposing the name of Mr. T. Davey, of Clifton, Bristol, for the Vice-President's chair of the Association.

Mr. E. Brightman, in seconding the election of Mr. Davey, said it gave him real pleasure to do so, as he knew that no meeting passed without Mr. Davey being present, if at all within his power, and he was sure that no member had the welfare of the Association more at heart.

The Chairman said he could not possibly say more than had already been said, and with which he heartily agreed; he would, therefore, at once put the motion to the meeting.

On this being done, the election of Mr. Davey was unanimously carried, with acclamation.

The Chairman then called upon the Hon. Secretary to read the paper sent by one of their members, Mr. Mansfield, of Northampton, and entitled, "Are Gelatine Plates Suited for Landscape Work?" (next week).

At the close of the paper, some very fine photographs of landscapes by gelatine plates were handed round, and greatly admired.

Mr. Daniel remarked that the latitude evinced by the plates was wonderful, being more like that of good wet plates than anything else, with the foreground fully rendered, the ultra-distance being nevertheless beautifully defined; the want of this quality he considered the great fault about the general run of rapid gelatine plates.

Mr. Brightman said that in almost every picture there are objects requiring, at least, respectively five or six different lengths of exposure; now unless a gelatine plate would allow the longest to be given, without, in most cases, ruining the distance which required the shortest, it was inferior to the wet plate, and he considered this the general gelatine plate's weakness, and which the author of the paper had so effectually in his plates endeavoured to obviate.

Mr. Radcliffe said he should, after seeing the beautiful results shown, reverse his decision to abandon gelatine work this summer, and go in for slow plates like Mr. Mansfield; he should find no difficulty in that, having exposed some of his collodio-albumen plates in interiors for seventy-six hours.

Mr. Stevens asked what was Mr. Mansfield's formula.

Mr. Brightman replied that it was in this year's Almanac.

Mr. Powell said that his friend, Mr. Yorke, told him of a very simple plan he had of washing emulsion; he put about a pint into a half-gallon ink jar, and by revolving it slowly in cold water the emulsion set all round the inside in a thin layer; a tube from the cold water tap is then put into the jar, the water turned on, and perfect washing accomplished.

Mr. Daniel explained a very simple mode he adopted for washing; the jelly emulsion was finely broken up and placed in an old-fashioned tea-pot, which had a spout going as near the bottom as possible, a water-pipe connected with the spout, muslin tied over the open top, and a stream allowed to run briskly through; the jelly was drained, melted in the pot, muslin tied over the spout, and the plates coated from it. There was by this plan no changing about.

Mr. W. Stephens thought both plans excellent, but rather preferred the latter.

Rev. H. Hare invited the Association to hold an extra outdoor meeting during the season in Great Elm, and lunch at his house; the Hon. Secretary had been to reconnoitre, and had been much pleased with the scenery.

The Chairman proposed a vote of thanks to the Rev. H. Hare for his kind invite, and that it be accepted, which motion was carried unanimously.

On the motion of Mr. T. Davey, a vote of thanks to Mr. Mansfield, for his paper, was passed.

Bolton Photographic Society.

The ordinary monthly meeting of this Society was held at the Baths, on Thursday evening, the 4th inst., Mr. Thomas Parkinson in the chair.

The minutes of the previous meeting having been read and confirmed, and other formal business transacted,

The Secretary read a communication from Mr. John Urie, Nethergate, Dundee, informing the Society of a proposed Photographic Association for Dundee, and requesting a copy of the rules.

One of the members drew the Chairman's attention to the fact that, through an oversight of Mr. Galloway's, no report of the annual meeting, held January 16th, had appeared in the journals, and consequently the list of officers, &c., in the Year-Book were, to a certain extent, obsolete. The following is the list of officers:—

President—John Hick, Esq., M.P.
Vice-President—Mr. Thomas Parkinson.
Secretary—Mr. C. K. Dalton.
Treasurer—Mr. Wm. Banks.
Council—John Hick, Esq., Messrs. Parkinson, Dalton, Banks, Rideout, Shipperbottom, Tong, Grundy, Harwood, and Galloway.

The remainder of the evening was occupied by the examination of a large camera, shown by Mr. Parkinson, also a set of apparatus, camera, and patent changing box (by Hare) shown by the Secretary, including a new swinging front arrangement. The Platinotype Company, having sent a number of prints for exhibition, the Secretary proceeded to give details of the manipulation, &c., and developed a number of views, &c., from a series of negatives taken by Mr. Parkinson, including Mytton Hall and Church, Smithells Hall, and other places of interest. The members having expressed the pleasure they experienced in examining the prints sent, the meeting was brought to a close by a vote of thanks to the Platinotype Company for the "courtesy and promptness with which they acceded to the Society's request for specimens," and to the Secretary for the manner in which he had explained and demonstrated to the members the process of development.

Glasgow Photographic Association.

A popular evening of this Society was held in the Trades Hall, Glassford Street, on Thursday evening, February the 26th, Mr. J. Jex Long in the chair.

To save time, the reading of the minutes of the last meeting was postponed till next meeting.

The following gentlemen were duly elected members:—Mr. Brown (Paisley), and Mr. Macindoe (Glasgow).

The Chairman introduced the lecturer, Mr. W. H. Davies, of Edinburgh, who read a paper entitled "Art and Natureas Represented by the Camera and the Brush" (in our next), after which some forty transparencies from instantaneous negatives of rustic life, by Mr. Foster, of Coldstream, and Mr. McGhie (the secretary), and of many paintings by Sam Bough, Herring, Beattie-Brown, &c., were exhibited on the screen by means of a powerful oxyhydrogen limelight. Each subject was minutely described, and its characteristics pointed out by the lecturer. The Chairman, in proposing a vote of thanks to Mr. Davies for the able manner in which he had rendered a most enjoyable evening, said there was no pastime he could recommend to young men more fascinating, and at the same time more likely to keep them out of temptation (from a moral point of view), than photography. He felt sure he was expressing the sentiment of the audience when he said that the lecture and exhibition just witnessed would tend, in a great measure, to stimulate and educate those art qualities inherent in our nature.

After a few remarks by Mr. Davies, a vote of thanks to the Chairman brought the meeting to a close.

Dundee and East of Scotland Photographic Association.

This Association held its first general meeting in the Masonic Hall, Meadow Street, on Thursday last, Mr. G. F. Rogers in the chair. The minutes of the last meeting having been confirmed, Mr. John Urie read the rules drawn up by the Committee appointed at the last preliminary meeting, which were approved, with slight alterations. The following gentlemen were duly elected office-bearers:—

President—J. C. Cox, Esq.
Vice-Presidents—Messrs. A. Robertson, and G. D. Valentine.
Secretary—John Urie.

Treasurer—W. G. Tannahill.

Council—G. F. Rogers, H. G. Fraser, C. Johnstone, A. Donald, J. N. Davidson, J. Abbot.

A hearty vote of thanks to the Chairman brought the meeting to a close.

The following are the rules of the Association :—

1.—That the object of this Association is to further the advancement of photography, by holding periodical meetings for reading papers, and interchanging ideas and results of experiences, with discussions thereon ; and also for promoting exhibitions of photographic art, &c.

2.—That masters and amateurs shall pay 5s., and assistants 2s. 6d. annually, towards defraying the expenses of this Association ; and that the funds so raised will only be expended on the objects stated in Rule 1 ; and such subscriptions be paid before the annual election of office-bearers—failing which members are neither entitled to vote nor stand for office.

3.—That members of this Association shall not be held liable for any monetary obligations undertaken by the Council beyond the amount of their subscriptions.

4.—That the business of the Association shall be conducted by a President, two Vice-Presidents, Secretary, Treasurer, and Council of six members (four forming a quorum and the Chairman having a casting vote), and will be elected annually at the end of each Session from amongst the members, being nominated the previous evening for such office.

5.—The session to be held from October to April, both included, —at such times and place as members may decide—meetings to be notified by post not later than two days previous ; and the Annual General Meeting seven days before such is held.

6.—That names of applicants for membership must be proposed by one member and seconded by another, and be lodged with the Secretary in writing seven days at least before next meeting, when they will be duly elected and receive the right hand of fellowship. A vote of the majority of the members absent being necessary to place a new member on the roll ; any member shall have the privilege of introducing a friend when he so desires.

7.—That honorary members may be elected whose scientific or artistic eminence may justify the distinction, the mode of election to be the same as for ordinary members. Honorary members shall enjoy all privileges of membership, except the right of vote on any matters appertaining to business, or appropriating the funds of the Association.

8.—That the office-bearers and Council, or a requisition signed by seven members to the President, shall have power to call a special meeting at any time within the year, setting forth in the circular the purpose for which the meeting is desired.

9.—That the Association shall hold photographic exhibitions or conversaziones, or both combined, annually, or at such times as may be determined by resolution of the members.

10.—Members are requested to put their photographs in the hands of the Secretary, for the Association's album, which will be laid on the table not less than once a month, for inspection, with name and date of joining, with term of office (if such be held) attached.

11.—Members retiring from the Association shall give notice in writing to the Secretary, failing which he shall be held liable for his subscriptions. Members two sessions in arrear will be struck off the roll, and cannot be admitted again until such subscriptions be paid up in full ; and that, in the event of any member being deemed incompatible with the well-being of the Association, it shall be competent for any member to move his ejection at any of the ordinary meetings, notice thereof being lodged with the Secretary in writing, signed by the mover and seconder, at least seven days before such meeting, whereof due notice will be given by printed circular to each member and party implicated, containing such motion, in addition to any other business ; and that, on said motion being carried, by at least two-thirds of the members present, the member so ejected shall forfeit all rights appertaining to membership, as well as all monies he has paid into the funds.

12.—That no accounts shall be paid by the Treasurer before being passed by the Council, who shall appoint two auditors to examine and audit the accounts at the end of every session.

13.—That the Association agree to have a special holiday in summer, the date of such to be fixed at the annual general meeting in April.

14.—That this Association shall only be dissolved on a vote of two-thirds of the members present at a meeting specially called for that purpose, notice of motion being given and published as detailed in Rule 2 ; and in the event of such motion being carried, a committee of five members shall be appointed to wind up the whole affairs of the Association, with power to deal with any surplus funds as they may deem most expedient.

15.—That no alterations nor additions in the preceding rules shall be made except by two-thirds of the members present at a meeting specially called for the purpose of considering such an alteration, of which notice shall be given at a previous meeting.

Lewisham and Blackheath Scientific Association.

On Tuesday, March 2nd, 1880, Mr. J. Werge delivered a lecture on "Photography, its Origin, Progress, and Practice."

"Photographs are familiar objects in every household ; but, like 'cups and saucers,' in daily use, few see them made, or know their history. The early history of photography is remarkable, interesting, and romantic. For centuries a dreamy idea occupied the minds of romance writers that Nature possessed the power of delineating her features far more faithfully than the hand of man could possibly depict them ; and all sorts of impossible and impracticable processes were imagined and described by the ancient novelists ; yet, none of the alchemists either stumbled upon her secret or seriously endeavoured to obtain it by careful research. That triumph was reserved for men of our own time. To the nineteenth century belong the honour and glory of the two most marvellous and useful discoveries ever made by man—the electric telegraph and photography—and so useful have the results and applications of these discoveries become, our respect for them and the names of their discoverers are lessened by familiarity. To enable us to form some idea of the obligations we are under to those men who made photography practical, let us picture to ourselves men like Thomas Wedgwood and Sir Humphrey Davy striving to make the sun depict Nature with only *partial success*, and finally abandoning the pursuit as hopeless. Then cast our mind's eye into a dingy room in Paris—a room crowded with dirty bottles, chemicals, and nondescript articles, and there see a little fat, scrubby-looking Frenchman persistently spending his days and nights for fifteen years, labouring incessantly—sometimes hopefully, sometimes frantically—so much so, his wife deems him mad, and consults a physician on the state of her husband's health and mind. Observe him polishing a little silver plate and coating it first with one thing and then with another. See how anxiously he examines it from time to time, and how sadly and disappointedly he puts it away in a cupboard after a day of weary and profitless toil. Imagine his joy and exultation in the morning on discovering a visible picture on the very plate that was a blank and a disappointment the night before. That was the first Daguerreotype, and that man was Louis Daguerre.

"Now let us look into the quiet study of an English clergyman at Peckham ; observe a grave and somewhat comely gentleman examining a white glove—a lady's glove. Is it a love-token, or a relic ? He examines it again and again, but finally shuts it up in his desk with a sigh of disappointment, and leaves the room. When next he enters, he goes to his desk, opens it, and is amazed. He seizes the glove, holds it up to the light, and looks at it with rapture. His sense of sight is convinced at last. A picture is on that white glove.

"That was the first developed photograph, and that clergyman was the Rev. J. B. Reade. So much for the romantic history of photography. Its datal history may be briefly told.

"The first three steps towards a solution of the problem were slow and far apart—extending over a period of three centuries.

"In the sixteenth century, one of the alchemists observed that the sun's rays blackened chloride of silver. In the seventeenth century, Sir Isaac Newton divided a beam of light into its component parts ; and, in the eighteenth century, Charles Wm. Scheele discovered that the violet end of the spectrum discoloured chloride of silver much sooner than the red end. It is remarkable that all these discoveries were made when the greatest concentration of figures prevailed in each century.

"In 1555, the effect of light upon chloride of silver was first discovered ; in 1666, Sir Isaac Newton set forth the solar spectrum, and in 1777, Scheele obtained the first photograph of that spectrum—a rude one, it is true—but the very first photograph on record, nevertheless. Whether 1888 is to bring us photography in natural colours, or not, remains to be seen—but of that anon. Those three distinct discoveries were the foundations of all our present photographic knowledge, and

with that knowledge and those materials Wedgwood and Davy began their experiments towards the close of the eighteenth century—about 1790."

The Lecturer then stated and described the various discoveries made up to the present time, and then entered upon the subject of light, and the possibility of obtaining photographs in natural colours, and said :—

"The first things to be borne in mind are the facts that light is the stimulant, and darkness the sedative of Nature. Were there no light there would be no energy, and were there no darkness energy would be quickly destroyed. Light acts upon every substance, animate or inanimate, according to its constitution and ability to absorb or reflect the variously coloured rays of which light is composed.

"There is no such thing in existence as palpable colour. Any substance that conveys an idea of colour is only stained or impregnated with something that possesses the power to absorb, or retire, all the colours of the rainbow, except the one it reflects, which is the colour that you suppose that you see in that apparently coloured substance. When an object appears black it absorbs *all* the rays, and when an object *reflects all* the rays it appears gray. There is nothing absolutely white. Newly fallen snow is the nearest to white; but the purest white substance we can perceive is, at the best, *degraded white*. * * *

"A perfectly constructed and healthy retina will be able to receive all the undulations that can possibly arise from any combination of any of the normal colours of the spectrum, just as a good and tuneful ear will distinguish all the minute divisions of sounds that are expressed in the chromatic scale. From this it will be seen that the nearer a prepared plate approaches the condition of a perfectly healthy retina, the more sensitive it will be to the undulations of the variously coloured rays, and the more faithfully it will register the effects of those undulations in monochrome. That photographs in natural colours can be produced by such means appears to be an impossibility, for all our ideas of colour are only the results of sensations produced on the retina, and conveyed to the brain by the optic nerve. If a photographic plate, which represents the retina, were provided with an optic nerve and a brain behind, there might be some hope; but, as it is, we can only hope to obtain such results in monochrome as those with which we are already acquainted. On immersion of these two pieces of paper in a solution of ferrocyanide of potassium, a red picture will appear on one, and a blue one on the other. From this some will argue that photography in natural colours is a possibility. I do not. The same solution developed the two colours, it is true; but each piece of paper was differently prepared before it was exposed to light. I think I have shown pretty clearly that photography in natural colours is a physical impossibility, and from these results I have no hesitation in saying that photography in natural colours is also a chemical impossibility.

"I have constructed this representation of the solar spectrum with coloured materials that ladies may see the photographic effects that their dresses and ribbons will produce, and I shall endeavour to explain how the complexion behaves in the production of a photograph. It will be seen from this photograph of the spectrum that the violet end produces *light tints*, and the red end dark ones—almost black. Supposing a lady with bright blue eyes, ruby lips, peach-like cheeks, and doubtful auburn hair, to be seated before the camera, she at once, and especially if she has any violet powder on her face, puzzles the photographer, for she presents in her own face the extreme ends of the spectrum, and the photographer has to decide which shall receive his best attention. If he understands his business he will decide in favour of the eyes, and produce the portrait with much darker hair than is natural, rather than produce an eyeless portrait, because, the blue rays from the eyes being much quicker in their action than the red rays from the hair, the eyes would be obliterated before the hair could be properly rendered. All these different conditions of colour and energy have to be considered in the production of a photograph, and it becomes necessary for the photographer to employ a chemical combination that is most sensitive to all these varying conditions.

"Various methods have been employed, and until recently collodion was the best vehicle for carrying the sensitive salts; but it is now placed beyond all doubt that a gelatine film charged with bromide of silver is not only more sensitive, but that registers more faithfully the undulations or effects of the less actinic rays than collodion ever did. For those two important reasons it is highly probable that gelatine will push collodion out of the world of photography just as ruthlessly and unceremoniously as Archer's improvement did the Daguerreotype."

The Lecturer then described the gelatine process and all the modern improvements in photographic and photo-mechanical printing, and brought the lecture to a happy close—having traced photography almost chronologically from its earliest inception and state of instability to its present condition of perfection and permanence.

A vote of thanks was proposed by Dr. H. E. Armstrong, F.R.S., and seconded by Charles D. Davies, Esq.

To Correspondents.

C. R.—*Collodion cuir* is simply normal collodion mixed with castor oil. You must add the oil in proportion to the amount of pyroxylin contained in the collodion. Thus, if it only contains 1 per cent of cotton, it will only require half as much oil as if it contains 2 per cent. As a rule, one or two drops in four ounces of collodion will give a tough film.

Hector.—Rub a little talc upon the glass plate.

Printer.—The stains are evidently due to hyposulphite of soda. It is not worth while saving the cuttings of washed prints. Use hydrochloric acid or common salt for precipitating your silver solution.

Edward J.—Write to the Platinotype Company. See our advertising columns.

Walter W.—We cannot answer questions by post. Write to the Autotype Company or to Marion's; you will find their addresses in another column.

J. Simons.—Begin with less ammonia, and add gradually until the development goes on more quickly. There is an article in our Year-Book on portraiture by gaslight.

L. Thomas.—The Secretary is Mr. H. G. Cocking, High Road, Lee. Write to him.

Hypo.—No hurried washing is to be recommended. Alternate washing of the prints in warm and cold water is perhaps the most rapid means of removing hyposulphite.

Streak.—Streaks in the direction of the dip have been more than once discussed in these columns. See our issue for the 20th June last.

A. M.—Very likely: but what would the proprietors of *Punch* say? They are very jealous about the copyright of their engravings.

Vol Vox.—Yes, the Autotype Company use nothing but cyanide of potassium, and therefore, we suppose, prefer it to hyposulphite of soda. We are among those, however, who have a wholesome dread of cyanide.

Collodion.—See Dr. Monckhoven's paper in last year's Year-Book on the production of horny and powdery collodion films. You will find his remarks very practical.

Silver Photo.—Dr. Gayer's plan was to fix one print at a time in a fresh strong solution of hyposulphite in the dark; there was then no formation of an insoluble silver albumen compound, or albuminate of silver, according to him.

J. B.—The alcohol is methylated for that very reason. If you could remove the "nasty smell and nasty taste" you complain about, the Inland Revenue would not be protected. It has been the aim of Government to give the alcohol a "nasty smell and nasty taste," in order that it may not be used as you wish.

H. Spinks.—We certainly think not. You would not get a perfect emulsion by that means. We have tried *iodide* of silver in the way you mention, and that does not answer.

Northumberland.—Newman and Co., 24, Soho Square, publish a shilling manual on the colouring, &c., of photographs, which would probably give you all the information you want.

J. S. Milner.—We cannot give you an answer without making the experiment. Next week we hope to satisfy you.

F. H.—It is not starch, for it does not answer to the iodine test, but there was so little of it that we cannot say for certain whether it is albumen; but, as we said before, we have every reason to believe it is albumen.

H. G.—Thank you for kindly expression about the News. We will endeavour to give you a detailed answer next week.

P. G.—We cannot find that the second patent is being worked at all; our information was derived from one of the Continental scientific journals, but we are sorry to say we are uncertain which one.

R. P.—It is not likely to have been bronze powder, as you say. But nearly all cardboard contains antichlor, or a bleaching compound of some kind, and if photographic prints are packed with their faces against such card, and not stored in a perfectly dry locality, such spots as your picture shows are not unlikely to occur.

Several correspondents in our next.

The Photographic News, March 19, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photography and Royalty—The Law of Patents—The Diaphote—Use of Spencer's Metal in Photography.

Photography and Royalty.—The heroic determination of the Empress Eugenie never again to honour photographers with sittings is difficult to understand, unless it means that with the pilgrimage she is about to undertake to Zululand she intends to throw off all the pomps and vanities of this wicked world. It is to be hoped that no member of our Royal Family will follow her example. The photographic profession owe much to the patronage of Her Majesty and her numerous descendants, and there is scarcely a town of any importance in England which does not boast of its "Photographer to the Queen." Indeed, while Her Majesty continues to lend her countenance to the camera, it does not matter very much whether she appears in public or not. Any loyal subject can gaze upon the counterfeit presentment of the highest lady in the land for the small sum of one shilling; whereas for half-a-guinea, on one of the rare occasions on which she assists at public proceedings, he may only be gratified by the sight of her back hair. It would be interesting to know, by the way, what is the method of procedure when Royalty's portrait is "taken." Does the daring photographer use the head-rest himself, or is this necessary apparatus adjusted by some lord in waiting? Is Her Majesty requested to "look pleasant," and does she partake of the weaknesses of the meanest of her subjects, and occasionally "move"? May the operator, without running the risk of being ordered for instant execution, hazard the opinion that he does not like the expression of the Royal lady's face, or find fault with the colour of her dress? All these are grave and weighty matters on which those photographers who have not been permitted to display the Royal arms, and the magic words "by appointment," would be glad to be enlightened. What a quantity of good things, we are convinced, Messrs. Downey could tell on the subject if they had a mind!

The Law of Patents.—In these days of prolific inventions and patent processes, it may be interesting to those busy-brained photographers who are always finding out something new, to know that the Lord Chancellor has recently given a decision which is of considerable importance in regard to patents. Some ten years ago Lord Hatherley, then Lord Chancellor, held that if two applications were made for the same patent, the applicant who first obtained his Great Seal should be held to be the inventor, and to him letters patent should be granted. And this rule was to hold good even though the other applicant might have been first in obtaining provisional protection. The decision was manifestly an unfair one, since it absolutely offered a loophole for an unscrupulous person to borrow the original inventor's ideas, and by using greater expedition it was possible to procure a patent under false pretences. In addition to this, as Messrs. Hughes, patent agents, of Chaucery Lane, point out, the decision has borne hardly on inventors who have been compelled to push on with their patents, often before they were certain of their practical value. Fortunately, lawyers, like doctors, not seldom disagree, and a case has just been settled in which Lord Cairns has expressed an opinion totally opposed to that of Lord Hatherley. The present Lord Chancellor considers the Legislature intended the patentee to have the full term of his provisional protection for working out the details of his invention and perfecting his specification, and in the case referred to ordered the first applicant's patent to be sealed, though the later one, who had got his seal first, opposed him. Inventive photographers, therefore, may breathe freely, and go joyfully to work, undeterred by the scheming of rivals.

The Diaphote.—The very latest discovery of our trans-Atlanic brethren is one that completely throws the wonders of the telephone into the shade. Dr. H. E. Licks, of South Bethlehem, Pennsylvania, has found out a method of transmitting photographic images by means of electricity, so that it may be possible ere long, if the report of the discovery be not exaggerated, to take a photograph in England of some beloved person in Australia or New Zealand! Dr. Licks uses two mirrors, and the principle is that the image thrown on one mirror can be received on the other. The receiving mirror is composed of an amalgam of selenium and iodide of silver; the reproducing mirror of selenium and chromium. The waves of light from an object are conducted through an ordinary camera to the first mirror; here a chemical change is set up by the action of light, and these changes are recorded in the second mirror by means of electrical current. The mirrors used by Dr. Licks are six inches by four, and each is composed of seventy-two sections, each section being connected with the battery of the corresponding section of the other mirror by its own wire. The "diaphote," which is the name given by the inventor, is certainly an astounding discovery, but until we hear more about it we prefer to adopt Mr. Gladstone's cautious plan, and keep our minds open. In the meantime a daily newspaper has gone into raptures over the possibilities of what the diaphote may accomplish in the transmission of light, prophesying that mines could be illuminated, explosions be things of the past, and that even London itself could be lighted by sunlight drawn from the antipodes. The proprietors of the patents for luminous paint will hear of the "diaphote" with much dissatisfaction.

Use of Spence's Metal in Photography.—The new metallic compound discovered by Mr. J. Berger Spence possesses more than ordinary interest to photographers, from the fact that it is possible to obtain perfect castings with it from gelatine moulds. The compound which is known by the not very elegant name of Spence's metal belongs to the class known as thiates or sulphur sulphides, and is the result of a discovery, made a year ago by Mr. Spence, that the sulphides of metals combined with molten sulphur formed a liquid. This liquid on cooling became a solid homogeneous mass, possessing great tenacity, and having a peculiar dark grey, almost black, colour. The peculiar properties of this metal are its low melting point of 320° Fahr., its expansion in cooling resembling type metal and bismuth in this characteristic; its power of resistance to atmospheric influences; the inability of acids to affect it, a mixture of concentrated hydrochloric and nitric acid acting upon it only very slowly when finely powdered, and not at all when in bulk; and its quality of taking a high polish. For casts of all kinds, artistic and otherwise, for the joining of water and gas-pipes, for hermetically sealing bottles, and for preserving fruit and other articles of consumption, it is considered to be admirably adapted. Being almost a non-conductor of heat, it cools so rapidly in a gelatine mould that it yields a perfect impression before the form of the mould is destroyed, and if the gelatine be allowed to remain on the metal till cold it remodels itself ready for the next casting. The power it has of reproducing the most minute details is well shown in the occurrence which led Mr. Spence to think it could be utilised for works of art. In order to obtain a perfectly smooth surface he had been running molten metal on to a piece of glass, but before doing so he had chanced to touch the glass, and had left the marks of the pores of the skin of his fingers upon it. On removing the metal, these marks were found to be reproduced, and so indelibly that they did not disappear on polishing the metal surface. If this be the case, does it not seem possible that this new compound might be used to take an impression from a gelatine and bichromate photograph, and so easily produce a cast which could be used in the ordinary printing-press? In the Woodbury process, the reproduction of the gelatine photograph in metal is effected by means of hydraulic pressure, and it is a singular fact that though the gelatine film is used before it becomes dry in order to obtain greater relief, yet, as the resulting prints amply testify,

the impression made on the metal is sharply and accurately defined. What effect the pouring of a molten compound on to a wet gelatine mould may have, can of course be only determined by experiment. It is possible that Spence's metal, from its perfect resistance to acids, might be found extremely serviceable for developing dishes. M. Davanne, at the last meeting of the Photographic Society of France, suggested the substitution of metal for the heavy porcelain dishes now in use, and mentioned sheet iron, tin, copper, zinc, and aluminium, as metals which he found suitable, giving the preference to zinc for cheapness. It appears to us, however, that this new sulphur compound would be found far superior to zinc in its enduring qualities; while the readiness with which it lends itself to the moulder gives it an advantage which manufacturers will not be slow to appreciate. The metal is very cheap, being sold at £15 per ton, £3 less than the cost of lead.

FRENCH CORRESPONDENCE.

Gillot's Paper for Making Drawings as Copies for Typographic Plates—Angerer's Paper—Cutting out by Hand the White Spaces of a Plate—Present Condition of the Question of Photo-typography.

Gillot's Paper for Producing Typographic Drawings.—The house of Gillot, which for several years has occupied itself with improvements in the photo-engraving processes, has devised a method for inducing the typographic draughtsmen to prepare their drawings in a form which renders very easy their transformation into a typographic plate. For this purpose they have produced a new kind of paper. This paper is first covered with a tolerably thick and very even coat of whiting. A plate engraved with a series of fine parallel lines very close together is pressed on the surface, and then turned round, and again printed with the lines at right angles to their former direction. In this way a very fine cross-hatched surface is produced on the paper. With this paper the draughtsman can turn out modelled drawings; the high light he can make a pure white with the scraper; by using that instrument less forcibly, the half tones are produced; still darker tints are produced by the pencil which touches the tops of the ridges, but leaves the bottom of the grooves still white; and finally, when intense black is required, the whole can be washed over with the brush. From an original drawing of this kind an exact photo-typographic copy can be taken direct. The difficulty of obtaining a typographic plate of a drawing with graduated shadows,—for example, a sketch in Indian ink,—is well known to every printer to be very great. By means, however, of this method introduced by M. Gillot, typographic reproductions are executed of really wonderful truth. I have seen some proofs obtained in this way which resembled rather impressions by phototypie than typographic prints.

Angerer's Grained Paper.—There is another kind of paper which is used for a similar purpose, and is produced commercially by Herr Angerer, of Vienna, only, instead of by cross hatching, the effect is produced in this instance by graining. The grain of the paper is fine or coarse according to the number it bears. It is not coated with a layer of whiting, and is more adapted for working with a fatty pencil so as to yield a drawing fit for lithographic transfer. As in the former case, the pencil leaves a greater or less number of white points, thus producing the gradations. By using this paper a transfer can be effected directly on to the stone, thus avoiding the necessity of taking a negative; but I doubt whether the results obtained with it are as complete as those obtained with the paper of Gillot. I have seen some impressions executed in this way, which had all the character of crayon lithographs, and were not wanting in artistic effect. Perhaps better results might be got by making the drawing larger than it need be, and then reducing it by photography; it would gain both in delicacy and firmness. For producing the intense blacks with this paper of Augerer's, either the brush may be used, or a very fin·ly-cut pencil, whose point is capable of working between the grain. The draughtsman can also make a paper for himself on which he can draw for typographic purposes, by using a roller, grained on the surface. He chooses a strong paper and works it all over with this roller; by this means a diaper pattern is produced on the paper, which serves the same purpose as the crosshatching in the paper of Gillot, or as the grain in that of Angerer.

Cutting out the White Spaces by Hand.—Whatever be the method adopted, it will be always necessary to cut away the parts of the metal plate corresponding to the high lights. The defect of all chemical or electro-chemical engraving for typographic purposes is due to the absence of sufficiently deep depressions. For copper-plate engraving, and all engraving processes where the depressions form the printing portion, the metal need only be slightly cut away for rendering the black lines, and must not be touched in the spaces corresponding to the white parts. In typography, on the contrary, we should have patches of black and smudged lights, unless the spaces between the lines of the drawing be gouged out, so as to leave the lines themselves projecting. The necessity for hollowing out the white parts by hand will remain, whatever improvements are introduced into the typographic process, and this manual labour can only be dispensed with when the drawing is full of lines or of points close together. To take an instance, the inverse impression from an engraved copper plate could not be used directly for a typographic plate. Inking such a plate would smudge the whole of the print. Nevertheless, according to the latest accounts, it seems probable that we may be able to obtain directly—except for the necessary cutting away of the metal, alluded to above—a typographic plate by using the inverse impression in electrotype of a photo-engraving—more especially one of those photo-engravings in which the graining is strongly marked.

State of the Question of Typographic Photo-engraving in France.—The subject of photo-engraving for typographic purposes is one of the most important of those relating to the industrial applications of photography. Convinced of this, our Society for the Encouragment of Art and Science applied to Manufactures has offered a prize of 2,000 francs to be awarded in the present year to the inventor of the best typographic process by which impressions can be pulled simultaneously from the text and photo-engraved plates inserted in the text, such plates to give prints with continuous modelling, as in the case of ordinary photographic prints in silver chloride. I am not aware whether any competitor has as yet presented himself—that is to say, any real competitor; for there are possibly several would-be inventors who are in hopes of entering for the prize, but who have not yet fully realized the difficulty of the problem they have set themselves to solve. The more I reflect on the conditions of the question, the more I appreciate the obstacles that have to be surmounted. How is a plate which presents the depressions and prominences of an ordinary photograph to be made available for typographic purposes? Probably it must be in the form of a collotype plate; but will that stand the wear and tear of the ordinary printing-press? Results of the same kind as those obtained by M. Gillot and M. Petit may, it is true, be rendered available in certain cases and by the aid of certain artifices, but there always remains the necessity of manipulating the plate at each impression, and arranging it afresh for the special work it has to perform. What we want to arrive at is a method of printing direct from a plate capable of being inserted in the text, and of yielding an impression at every pull, without more working than is necessary for the typo; at the same time the picture produced must have all the shaded gradation of the original photograph, without

being rendered by lines or points. If a collotype plate be inserted in ordinary type and an impression be taken simultaneously from the two, each must undergo a separate and different kind of inking. Happening yesterday to take up a work on chemical engraving, I found that M. Didot had in 1827 taken out a patent for taking impressions simultaneously from printing type and from lithographic drawings on stones inserted in the type; this, however, could only be done by a workman wetting the stone before each pull. My own idea would be similar to this, substituting only a hygroscopic layer of gelatine for the stone. There would be no cause to fear smudging, and the hygroscopic nature of the material employed would render one wetting sufficient for a great number of impressions. The only difficulty, though it is a great one, would be the formation of a typographic block which could withstand the wear of the press. The gelatine must be made to adhere so strongly to the support that it might not be liable to be pulled off by the sticky surface of the inking roller. When we see to what extent woodcuts and electrotypes are used for insertion in the text of the numerous illustrated works which now daily issue from the press, it seems impossible to attach too great importance to a process which should render photography applicable for the same purpose. LEON VIDAL.

WHAT IS AN ARTISTIC PHOTOGRAPH?

BY E. DUNMORE.*

We must bear in mind that, however much we may delight in being called "artists," there is a great deal of difference between those who have graduated in schools of art for the express purpose of becoming draughtsmen or painters, and those who skip the apprenticeship and rush into the world as full-blown artists by name without any, or, at most, the slightest, acquaintance with the necessary rudiments—frequently, I am afraid, without any preparation at all. The drudgery of learning the little things connected with it is set down as unnecessary and only suitable for beginners, or is loftily passed over with—"Oh, anybody can do that."

In artistic photography, as in almost everything else, success depends on a good foundation, and many little matters that cause great trouble to those who have skipped the rudimentary knowledge will be thought nothing of, even if they occur, with those who have laid a solid foundation, and have climbed step by step to the full and intelligent exercise of their ability.

By these remarks I have not the slightest intention to disparage those who are, as it were, "to the manner born," and artists from the first, although even these will find such elementary knowledge of much use. But to photographers as a body this lack of art-training undoubtedly operates as an immense drawback to the production of good work—that is, artistic work—and I, together with all lovers of photography, would gladly see it remedied. It has become so very common-place a matter to photographers to call themselves "artists," that by the very reiteration of the phrase they fondly believe they are artists, and quite as much entitled to be elected R.A.'s as any other class of men.

It is not so very many years since when long hair, smoking cap, and velveteen coat, with a general *négligé* appearance, was deemed almost essential to the artist, photographic or otherwise; but times have changed, and senseless eccentricities are the exception and not the rule. It is a hard matter to destroy one's cherished idols, and self-love is a medium through which it is difficult to exercise an impartial judgment on our own works.

The art-culture of photographers is daily becoming a more imperative necessity, and to compass this most desirable end should be one of the principal aims of our photographic societies. The South London Photographic Society has, I believe, always *inclined* to the art side of photography, in distinction to those whose almost sole aim is the scientific and manipulatory aspects. Now, in furtherance of this design, I would propose that periodically—say four times a year, that is, in the course of the session—some competent gentleman should be invited to give us an address on art and its requirements, and illustrate it by such pictures or cartoons as might be deemed applicable, pointing out and explaining the reasons why such and such treatment was adopted. I feel myself that some such occasional explanatory lecture would supply a want, and in some measure take the place or assist in personal research in works that might be possibly difficult of access to some of us.

Of course there comes the question of who shall be the lecturer, but I do not apprehend any very great difficulty on this head if it was once set about in earnest. However, I have somewhat digressed from the text of my paper, which would perhaps have been more fitly entitled, "What is Artistic Photography, and How is it to be Brought About?" It is a large question, and one that requires a more competent exponent than myself to fitly deal with it. I merely jot down my thoughts as they occur, and tell them to you in a crude sort of fashion. It is for you to winnow the chaff from the wheat and retain the useful, if any there be; and if I have so much as started a new line of thought, or revived an old one, in any of my hearers I am content, for I am conscious that much of what I have said is but "an oft-told tale," and has been written and said many times before, and I am sorry to say, perhaps as often forgotten. There is one thing, however, that I feel sure you will all agree with me in, and that is the absolute necessity for art culture, before any real advance can be made in this our hobby and our choice.

* Continued from page 128.

REMARKS ON WASHING PRINTS.

BY MARSHALL WANE.*

At the earnest solicitation of our worthy friend Mr. Neilson I have been induced to write a paper on something or other connected with our beautiful and wonderful art.

I confess, however, that I consented rather reluctantly, not from a wish to be disagreeable, or to keep back anything I could communicate that might prove of service to my co-workers; but from a difficulty in selecting a subject that had not already been more or less worn threadbare; further, I had a doubt as to my own ability in doing full justice to the subject chosen.

Mr. Neilson saw my plan of washing photographs, and suggested the idea of writing an article on the subject. I have, therefore, entered upon this to me rather difficult task, and I trust you will not be too severe in your criticisms, more especially when I tell you that I have had very little time to write the paper.

The perfect washing of silver photographs is absolutely necessary to render them permanent, and I consider that no expense (*i.e.*, within limits) or plans should be spared to attain this permanency, and thus remove that blot on our art usually termed fading.

Now, gentlemen, I am not putting myself before you as an inventor; I have simply adapted a well-known principle to a machine already in use, and I want to show you that by very simple means, photographs may be so washed as to secure that permanency which we are all earnestly striving to obtain. It is due to the public that we should use every means in our power to overcome this difficulty. Mr. Swan, on his recent visit to Edinburgh, called upon me and expressed himself as being greatly pleased with this washing apparatus, and gave it as his opinion that it was the best mode of washing prints he had seen, and further, he believed the principle to be perfection. Need I say more upon its

* Read before the Edinburgh Photographic Society.

merits? I have now but to point out a few causes, or rather what I consider some of the reasons, why prints fade; after doing so, I will show you a drawing of an apparatus well suited to overcome this serious drawback. There are other causes of fading besides insufficient washing—for instance, imperfect fixing, which is too often left to be completed by boys or girls. In former days, when I did the toning and fixing operations myself, I took the same pains in fixing as in toning; *i.e.*, I separated every print carefully, and, above all, was most particular in avoiding air-bubbles, which is a fertile source of spots. I believe that laying the wet print on impure blotting-paper is also a cause of fading, and when you consider that these sheets are used over and over again for weeks, can you wonder at it?

I have had grave doubts myself about these blotting sheets, and I have tried repeatedly to secure paper that I could rely upon, and I believe I have at last secured it. I had a chat some weeks ago with Messrs. A. and D. Paton, St. Andrew's Square, about this same paper, and I was put in communication with the chemist at the Paper Works. This gentleman is an able amateur photographer, and entered very heartily into the subject; and I am pleased to state that I now have a pure paper. I have brought a few sheets with me which you are at liberty to examine and take samples home with you to test. I have not yet done so, as it only arrived a few days ago. Should you like the paper, it can be procured from the firm whose name I have given. One ream, seventy-six pounds, of this paper cost me £3.

We have another source of fading, and that is the mounting boards supplied to us and C. D V. and cabinet mounts. Some years ago I had sent me from Paris, amongst my usual style of card, a few hundreds of a peculiar yellow tint. I disliked them the moment I opened the case. Alas! these yellow fiends haunt me to the present day. Some of you gentlemen might quote a bit of Shakspeare here, but not being well up, and not having a volume handy, I lose the opportunity. However, "the questionable shape" these cards turn up is no doubt well known to you, and would pass muster for a snow scene. I have never taken a snow scene, for they would remind me of the past; suffice it to say I have at this date hidden away in the dim regions of a Manx attic some two thousand cabinet mounts which I never intend to use. There cannot be a question about the mounts being the cause, as in every instance where one of my cards has spotted it was on one of these mounts. I have replaced all I have met with, free of charge. Then, again, in the matter of cardboards, I have had an instintive feeling that they were impure. I need not tell you about hyposulphate of soda being largely used in bleaching operations, nor the difficulty manufacturers meet with in eliminating the soda from the paper pulp. We are a great deal at the mercy of paper manufacturers and others, and I sincerely hope that they may be induced to try and give us a purer article.

I believe that cheap common albums have something to do with the fading of prints. Albums are often filled, and probably put away, in damp rooms, without a gleam of sunshine or a spark of fire. You can imagine that fading must ensue from such treatment, especially when in contact with probably very impure cardboard. Pianos, prints, books, &c., suffer, and it is not unreasonable to suppose that photographs must also suffer. There are well known cases where photographs have been subjected to very hard treatment, and still seemed none the worse.

In the year 1869 I sent eight 10 by 8 portraits in gold frames, and a case of cartes-de-visite and cabinet portraits, to the Palais de l'Industrie, Paris, for exhibition. During the Exhibition the Franco-German War broke out, and the French authorities received six hours' notice to clear out the whole of the exhibits. I surmise that they must have been put away in some underground vaults or cellars, for after more than two years I received my pictures back, but in a woeful plight. The straw was sopping wet, no paper round the frames, and the frames themselves were covered with a black fungus, and were utterly ruined. After washing the frames, what was my astonishment to find the photographs as fresh. brilliant, and pure as the day they were sent from my studio! Can you explain this?

Customers will often ask if photographs fade. Hitherto I have said Yes, everything fades or changes colour. Oil paintings, water colours, engravings, fabries, and, in fact, everything may. If you have had a new mahogany camera no doubt you will also have noticed how soon that changes colour by the action of light. I need not remind you that we fade; some of us are not so rosy and blooming as we were—well, I won't say how long ago, in case we should get at each other's ages, and I know that men, as well as the gentler sex, prefer to keep *age* a profound secret.

I read, a week or two ago, a description of an arrangement whereby a couple of butter tubs were utilized, as being simple and cheap. I agree with the simplicity, but not with the cheapness, for I should hesitate long before placing my print in a butter tub, and I would ask, how is the grease to be removed from the tub before using it, if it ever can be removed?

And now, gentlemen, for the machine. I have provided myself with a hasty drawing of it, as you will observe, an end section, showing "The Moulton Washer," and a water motor attached to it, which gives the motive power. The machine itself is not new, having been in use—but very sparingly—several years. The first I ever saw was shown me by our friend Mr. Pringle, and I was so much struck with its simplicity that I at once ordered one, to which Mr. Jas. Keith, of Charlotte Street, fitted the motor, and I must state that it works splendidly. It is a great treat to see it whirling round, and the prints being washed in a mass of fine spray, thus insuring perfect washing.

After our batch of prints are fixed, we give them a rinse in cold water, and then lay them, face up, on the net-work inside the drum, allowing, say, quarter of an inch between each print, and after the drum has been so filled, you set the machine in motion by turning tap of motor; you then turn the tap, which is connected with tube (india-rubber) connecting the top pipe or tube perforated, and the other end of this perforated pipe is again connected by a second india-rubber tube to the centre perforated pipe. The top pipe washes the *backs* of the *prints*, and the centre one washes the faces. You will thus see by this arrangement that the photographs are washed thoroughly *back* and *front* in a *continual* change of water, the waste water running out at the bottom of drum, two inches away, or below the prints. Ten minutes would be amply sufficient, but to be quite certain, I give mine about twenty minutes. If there are more prints than the machine will hold, you take out the first batch, lay them on blotting-paper, and damp them off, weed out the bad or imperfect prints, and while the second batch is washing, mount the first lot with starch paste.

This mode of washing is so vastly superior to the old syphon and other modes of washing, that I should strongly advise all to go in for it. The saving in labour is immense, and the saving in water is also immense; this you will at once recognize if you think of the hours prints used to be and are still left to wash. Some leave their prints all night. There is another very important point gained: the prints are not bruised, and further, I have not seen a single blistered print since I used this Moulton washer.

The cost of this apparatus is a little expensive; but it will soon repay itself in many ways. It saves time and labour, it saves one's temper, and, above all, it enables us to supply the public with a better article, so that my advice is get a Moulton washer, with or without a motor. The machine is remarkably easy to turn with a small handle; but if you have the motor attached, you simply turn on a tap, and the machine goes by water power and at any speed you like, *i.e.*, according to the pressure or height of your cistern.

At Home.

MR. VALENTINE BLANCHARD IN REGENT STREET.

In the neighbourhood of Fleet Street there have established themselves for several years past a body of gentlemen known by the name of the Whitefriars Club. The club is not a large one, and has never, we believe, since its commencement, numbered more than seventy or eighty members. It is for the most part a literary club—its predilection for the neighbourhood in question indicates as much—and amongst its past and present members may be cited men of considerable mark. Novelists, such as William Black and Charles Gibbon; editors of the great London dailies—to wit, Captain Hamber and Alfred Bate Richards; conductors of humorous periodicals that enjoy scarcely less influence in the country, the late Tom Hood of *Fun*, and William Sawyer of *Funny Folks*; actors of the first rank, like Barry Sullivan and William Creswick; painters and cartoonists, such as Orchardson, R.A., and John Proctor; these, to cite a few examples, are upon the roll of Friars. But the Club, noted as it is for the long list of talented men enrolled under its name, is famous in one other respect: it possesses, beyond question, the finest gallery of photographic portraits to be found in any hall or room in London. Probably, the collection does not at this moment fall short of half-a-hundred, and the pictures are all of them of magnificent proportions, taken direct on 15 by 12 inch plates, vigorous, life-like, and characteristic. Moreover, they are all of them the work of Mr. V. Blanchard.

In a word, no better evidence of Mr. Blanchard's ability can be afforded than this fine collection of portraits at the Whitefriars Club. It shows, too, the school, or style, of portrait, for which Mr. Blanchard has achieved a very extensive reputation. His large direct portraits—massive, dignified, full of life—are, indeed, too well known to require any detailed description here, for every visitor to the Pall Mall Exhibitions during the past half-dozen years must have witnessed examples of his handiwork. Mr. Blanchard is, to some extent, a disciple of Adam-Salomon, the well-known sculptor and photographer of Paris; but he has added to his portraits qualities which are personal to himself. The rich, luscious shadows of the Adam-Salomon school are present, together with other attributes inherent to Mr. Blanchard himself. We do not mean to say that the latter's portraits are better than those of his illustrious Paris *confrère*, but that, equally with Adam-Salomon's pictures, they have characteristics which mark them as the work of an artist in the foremost rank.

Mr. Blanchard's reception-room has but few pictures upon the walls, but they are well chosen examples of his best work. The most striking are "Rebecca at the Well," a fine Eastern study, which secured a medal at Pall Mall, and the picture of a Greek girl, that received a similar honour. In both of these pictures the management of the drapery is beyond praise; it falls in soft and graceful folds over the figure, without marring the outline of the latter. The Greek key pattern on the tunic of one of the models was pencilled by Mr. Blanchard himself, for he found that the addition of an edging or braiding to the drapery imparted a stiffness which was very objectionable to the picture. Miss Furtado, as Esmeralda, is another study Mr. Blanchard may well feel proud of, and some manly portraits on 15 by 12 plates complete the collection. Mr. Blanchard's charge for these pictures is £4 4s.; for cabinets, £2 2s. per dozen is asked, and for cartes, £1 1s.

The studio upstairs, at first sight, impresses one in a very singular manner. Instead of being light, it is dark. Indeed, there is little doubt that Mr. Blanchard employs less illumination than most of his brethren; he objects to flood his models with light. Half-a-dozen movable screens are about the studio, standing some eight feet in height and measuring six feet in breadth. These are put about with very little ceremony. "My light here is dead south," said Mr. Blanchard. "If I get bothered with the sun coming in, I simply stop the light from this portion of the studio, and go over there with my camera, where the light is easterly." And in a moment, our host had contrived by means of his screens a second studio at right angles to his first. "I consider," said Mr. Blanchard, "that the most perfect lighting a photographer can have is when the sun is obscured by a white cloud, and I endeavour to imitate this phenomenon in my studio. You see I have subdued illumination all on this side, and admit pure light only through two or three squares of glass."

Mr. Blanchard has an excellent plan for subduing his illumination. The side and roof, where it is of glass, and where the light is to be softened, are furnished with transparent screens of a movable character. In cloudy weather they are not needed, in sunshine they are. These screens are covered with *papier minéral*, which has the appearance of fine ground glass; the *papier minéral* has the advantage over ground glass of being far cheaper, and much lighter to handle. "English tracing paper won't do," says our host; "it goes yellow after a few weeks, and then good-bye to your white cloud effect; you get a yellow glare then, which is very unpleasant."

Mr. Blanchard has been working the powder process to good effect in producing pictures on opal, and he was kind enough to show us his method of working. In the Year-Book, recently published, will be found the whole details of Mr. Blanchard's present *modus operandi*, given in his own words, and we must say the examples of his work fully justify the enthusiasm with which he speaks of the process. Mr. Blanchard's copying camera for making his transparencies for the process is simple in the extreme. There is a long plank upon which the camera stands; at a little distance in front of the lens stands an upright board with a perforation in which the negative is placed. Beyond the negative, again, is a bit of white cardboard, or paper, sloping at an angle of 45°. The white paper reflects the light through the negative; and before focussing, a black cloth is simply thrown over the camera and over the upright board that carries the negative in order to shut out the light. This is the whole arrangement; there is no condenser, a No. 1 or No. 2B lens being employed for copying, and the apparatus, has the inestimable advantage that it can be cleared out of the way in an instant, and rigged up again without delay, trouble, or expense.

The opal pictures produced by the powder process are not so brilliant as carbon pictures, but that is a defect easily overcome with a little gum solution. Moreover, the powder pictures are manipulated to perfection with a stump and a little pumice powder. High-lights can be put in without difficulty; stains can be removed, and delicate effects of light and shade added with much nicety. The powder pictures are readily coloured, too, since they possess a fine tooth. In a word, we may confidently recommend Mr. Blanchard's mode of proceeding to all who desire to produce pictures of this nature upon porcelain or pot-metal.

Mr. Blanchard is not inclined at present to cry Eureka in respect to gelatine plates. He has had some marvellous successes and also some egregious failures; he has been fortunate in securing many clear transparent clichés with short exposures, and he has had the bad luck to come across not a few dirty plates. He believes that as manufacturers progress with their work they will be able to produce more certain and trustworthy films, but he thinks we are far off from perfection at present. There is still much uncertainty connected with gelatine plates, and although it were idle to deny that there is a great future for gelatino-bromide films, the days of wet plates are not yet numbered as some suppose. There are, doubtless, many of our readers of the same way of thinking as Mr. Valentine Blanchard.

Our "At Home" next week will be "The Woodbury Permanent Printing Company at Ealing."

The Photographic News.

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CONTENTS.

THE UNVARNISHING OF GELATINE NEGATIVES.

"It is all very well to tell us not to print our gelatine negatives before varnishing; it must be done," said a warm photographer of considerable decision, to us, the other day. We therefore suppose it must. But photographers should remember that it is a far more risky thing to print an unvarnished gelatine film, than one of collodion. Albumenized paper, even if damp, rarely stains a collodion film; the danger with the latter is more mechanical than anything else. But in the case of an unprotected gelatine film, if printing-frame, pad, and paper are not "dry as a bone," then stains must be the inevitable result.

At the same time, photographers should recollect that it is a very easy matter to remove varnish from gelatine plates. Unlike collodion, there is no risk here of dissolving away the film by spirit. Indeed, gelatine only becomes the harder on the application of alcohol. If you want to absorb moisture from a piece of gelatine and to harden it, put it into alcohol, and the thing is done. Professor Hermann Vogel, of Berlin, has advocated the employment of alcohol for hastening the drying of gelatine plates during their preparation. While they are still damp, he says, flow them with spirit, and this will soon take the moisture out of the plates. Therefore, if a gelatine negative has been varnished, nothing is more simple than to take the varnish off again, if you want to manipulate the plate once more. We have scrubbed away at a negative with a tuft of cotton-wool moistened in spirit, without failing to work the least damage to the film, and washing with spirit may certainly be resorted to in any case.

Under these circumstances, we are rather inclined to press upon our readers the advice given by Mr. Swan in these columns—to varnish their gelatine negatives before printing at all. It is rarely indeed that one miscalculates the intensity of a negative after a little practice, so long, that is, as you employ a sufficiency of developing solution, and thus remove all tendency to brownness in the transparent parts of the image; otherwise, as everybody knows, the printing qualities of a gelatine negative are considerably lowered. But if you do want to modify the character of your film subsequently, you run less risk, we think, by having to unvarnish once in a while, than in printing persistently from the bare film. In the case, however, of silver stains getting upon an unvarnished gelatine film through careless printing, these, our readers should bear in mind, are usually to be removed by the application of a weak solution of cyanide of potassium.

THE FRILLING OF GELATINE NEGATIVES.

In our columns last week a well-known manufacturer of gelatine plates pointed out a plan by which frilling of gelatine negatives could be corrected, and the specific given is simple and easily applied. It may, however, be worth while briefly to dwell on some of the causes of this disastrous evil. There is no doubt whatever that long cooking of the gelatine emulsion, when it contains the full amount of gelatine as was formerly the case, is conducive to it, and if this plan is resorted to, it can only be guarded against—or, we may say, be mitigated—by never raising the temperature above 90°, as first indicated by Mr. Bennett. Gelatine undergoes chemical changes by raising a solution of it towards the boiling point, particularly if the operation be prolonged. Putting aside, however, the gelatine itself as a cause of frilling, it should be asked if there is nothing else which will encourage its appearance, and to this we say that there are other points to which attention should be paid. The cleaning of the plates is an important item. In some recent experiments it has been demonstrated that when plates have been French chalked, frilling is of a most determined character, and that when cleaned with potash, rinsed, and nearly dried, the same emulsion gives perfect immunity from the evil. Again, if a plate be cleaned with Tripoli powder, and then polished, as usually is done for the wet process, it frequently happens that the film rises into small blisters during fixing, and the direction of the "rub" of the polishing handkerchief or cloth can be readily traced in the curves in which these blisters lie.

We wish to lay stress on these facts, as photographers are very apt to think that some method which is suitable to one process must be equally so for another. Thus French chalk is a very useful adjunct when preparing collodion emulsion plates, since it gives a *bite* to the collodion, which is not easily obtainable otherwise, except by means of a substratum. Again, those who prepare gelatine plates are aware that under some circumstances frilling at the margins of the plate is much more common than in any other part, and this is particularly observable when the emulsion is made up without the addition of any alcohol. In this case there is a repulsion from the edges of the plate, and a narrow band of gelatine dries first and rapidly, and it is just where this rapid drying takes place that frilling is most to be dreaded.

In an emulsion made up with alcohol, this marginal frilling is, to say the least, as uncommon as central frilling. This seems to point to the fact that too rapid drying of the films is a source of danger. If we consider why this is so, the cause may be apparent; the fact is, that too rapid drying puts the layers of the gelatine at different depths in unequal tension. We all know that in order to prevent glass from cracking with the slightest blow, it is annealed by a very gradual withdrawal of temperature, thus putting all parts into equal tension. If the glass be cooled suddenly, as by dropping a small ball of molten glass into water, we have what are known as Prince Rupert's drops, which on the smallest provocation fly into dust, owing to the different strains existing in the interior. So, again, if a wine glass be unannealed, the gentlest tap will shatter it to atoms from the internal forces. With our gelatine films something of the same series of strains exist, if the drying be not *regular and slow*. When water is applied to a rapidly dried film, the expansion of the top surface appears to be less rapid than that of the bottom surface; there is a consequent strain exerted to lift the film away from the plate, and the result is frilling in its most unconquerable form. Too great a thickness of gelatine is also an aid to the evil; but in this case it is probable that the adhesion to the glass is overcome by the tendency for the gelatine to expand; it is, therefore, needful in producing plates to guard against a too liberal application of the emulsion, unless chemical means be employed to prevent it.

These mechanical inducements to frilling, we believe, cannot be got over by any mode of development, or application of alum or spirit, but must be met by some mechanical means. Frilling induced by chemical condition of the gelatine, or by very modified mechanical tension, can be battled with by the means which have been indicated in our columns. We propose to revert to this matter at an early date.

Notes.

The Empress of Germany, it is said, never permits her photograph to be published.

A discovery is announced by Mr. Birch for detecting any tampering with cheques or drafts. The Bank of England is considering the discovery, and should it be deemed of value it will be adopted by that establishment, and no doubt communicated in due time to other financial associations.

They order things better in France. For the past ten years the Bank of France has taken into its confidence a clever photographer in the person of M. Gobert, and have fitted up a studio for him on the premises. Any erasure or ink stain—for the iron in writing ink always leaves a yellow tint behind, no matter how skilfully the paper is treated—is at once detected by the camera and sensitive plate, although very possibly invisible to the eye.

Captain Templar is continuing his experiments with balloon photography. Provided with an instrument constructed by Mr. Baden Pritchard, he made an ascent on Friday last, but the wind currents were too strong to permit him to secure a picture. He will renew his trials after Easter, with a snap shutter, employing Swan's extra sensitive gelatine plates for his experiments.

A very curious phenomenon was observed on Captain Templar's last ascent. The balloon rose beside a bank, or precipice of cloud, resembling a white cliff many hundred feet in height, and against this wall was thrown a well-defined shadow of the balloon, the car, ropes, and fittings being distinctly limned upon the huge luminous screen. But the balloon rose too rapidly to permit the camera to be worked with success.

Mr. Lansdell, the other night, in describing his journey through Siberia and China at the meeting of the Photographic Society, laid much stress on the pre-eminence of Muscovite photography, and adduced proof, if any were wanting, of the excellence of photographic portraiture, especially in Russia. But he said little about the art in China, and there seems to be little doubt that the natives of the Flowery Land have yet much to learn of photographic art and science.

A story about Chinese photography was rife some years ago, which our readers may still remember. At one of the watering places on the Chinese coast was a photographic studio, but the Celestial who invoked the sun's assistance to get a living was unable to take the portrait of any European; and the reason was this:—The Heathen Chinee's stock-in-trade did not include a camera, but simply a series of negatives of Chinamen. If a customer called he was well scrutinised by the photographer, who then looked through his negatives for one most resembling the caller. Chinese faces are pretty much alike, and therefore the matter resolved itself into choosing an image with about the same length of pigtail. The negative selected, the required number of copies were struck off, and sold to the customer.

Statistics about portraits must have considerable interest for the producers. We have it on good authority that the pretty picture of the Princess of Wales carrying one of her children pick-a-back, of which Messrs. W. and D. Downey are the authors, has reached a sale of upwards of 200,000.

By the way, it is rumoured that this season will witnes the advent of a new beauty who is to put Mrs. Langtry and Mrs. Cornwallis West entirely in the shade. She is the scion of a noble house, a young heiress with a rent-roll of £35,000 a year, and, according to the *World*, is *not* to marry Prince Leopold. Meanwhile Mrs. Langtry remains the most photographed private lady in the world.

The Alpine Clubs seem to be turning their attention to photography, and we may expect that the allurements of gelatine plates will induce many mountaineers to add a pocket camera to their equipment. But we want to do away with glass, if possible, for plates are so easily smashed in climbing excursions. Now, M. Warnerke, cannot you help us?

The Italian Alpine Club has published a book on Etna, which is well spoken of, under the title of "Un Viaggio all' Etna." We have by us, as we write, a very fine collection of Etna photographs taken by Professor Hermann Vogel, of Berlin, who made the ascent, with a camera, some years ago. There seems to be no difficulty, therefore, about Alpine climbers being photographers at the same time.

According to the new Copyright Act, the negative is to be the property of the photographer, provided it has been taken for a "valuable" consideration; hence a good deal of discussion has arisen as to the definition of the word "valuable." Not very long ago, an itinerant photographer passing through St. Germains on his way to Paris, and looking out for odd jobs on the way, beheld a little old gentleman muffled up against the cold in a balcony of one of the villas. He begged respectfully for permission to take a portrait then and there, and the gentleman favourably entertained the notion. Two very good negatives were secured, and the photographer promised next day to return with some prints for his patron to look at. To his dismay, he heard next morning, when he arrived with his proofs, that the gentleman who had ordered them had suddenly died, and his chance of getting paid was somewhat remote. But his regrets did not last long, for what was his surprise soon after, to learn that the little gentleman with the chubby face and comforter muffled around his neck was no other than Thiers, the ex-President of the French Republic. We do not know the modest "consideration" for which the negatives were executed, but it is hardly likely to have been "valuable" in the eyes of many people, yet one of the little negatives was sold for 3,000 francs, and many papers—the *Illustrated London News* among the number—paid highly for permission to copy the last photographic portrait of Adolphe Thiers.

Mr. England believes that if you emulsify for a couple of hours only, you may produce as good gelatine plates as when the operation proceeds for a week. But then he emulsifies at a high temperature, putting his jar into boiling water, and if he wants ten ounces of emulsion only takes some forty grains of gelatine to begin with.

On the subject of balloon photography and the value of pictures taken from an altitude, it may be worth while to point out that if the sensitive plate could only be made to record what the eye sees, the result would be very valuable Mr. Glaisher, the President of the Photographic Society, on the occasion of one of his numerous ascents, was fortunate enough to be able to take in at a glance the entire breadth of England; the coast at Lowestoft and the Welsh hills near Snowdon were visible to him from the car at one and the same time.

Herr Gruene, of Berlin, describes in the *Glasshütte* his process of etching designs or letters upon glass. As is well known, designs upon glass may be produced by etching it with dilute fluoric acid, after first covering the places not to be eaten away with an acid-resisting material. Almost all lacs and oil varnishes will protect glass from the acid for a short time, while by powdering on metal, copal, or other similar fine particles, absolute protection is obtained. Thus, Herr Gruene, according as he protects the glass in parts by varnish or powder, obtains shallow and deep etching on immersing the glass in the acid. No doubt, the photographic powder process could be used here with effect.

In the Photographic Society of Berlin a discussion recently took place as to the poisonous properties of chromium salts. On the one hand it was asserted that no case of poisoning with these salts had ever been known among dyers, though they were daily in contact with solutions of the chromates; on the other it was maintained that the poison of chromium had not the same effect on different constitutions. It appears to have been also observed that several obscure skin diseases, resembling in their symptoms scrophulosis and similar complaints, are due to chromium poison.

Professor Vogel has been experimenting with Dr. Eder's ferrous oxalate developer, and with the best results. He recommends the following formula :—

A.—Neutral potassium oxalate	260	grammes
Water	1000	,,
B.—Ferrous sulphate	100	,,
Water	300	,,
Sulphuric acid	2 to 4 drops.	

These two solutions are kept in stock, and when the developing liquid is required for use, three volumes of solution A are mixed with one volume of B.

According to a German chemist, Herr O. Ney, light acts upon beer to a considerable extent. Black, yellow, blue, white, green, represent the order in which the colours influence beer, when it is enclosed in bottles of the above colours. Green, it appears, has least influence, and, therefore, says Herr Ney, green bottles are the best in which to store it.

Topics of the Day.

MODERN PHOTO-LITHOGRAPHY.

BY HENRY BUTTER.

My practice differs in very few details from that described by me more than twelve years ago, but any improvements or modifications I have here set down. The process, as I here describe it, is such as is in general use by me at the present moment.

Two implements are especially useful to the photolithographer—the one a plumb-line, the other a spirit level. The drawing or diagram is stretched upon a drawing-board, and the plumb-line is used to ascertain if the board is in a perfectly horizontal position; the spirit level serves for the levelling of the camera. It is needless to add that the axis of the lens should be in a line with the centre of the diagram to be copied. If much work is to be undertaken, it is a good plan to have the camera-table running on a small tramway, which is at right angles to the upright drawing-board, which may also be a fixture.

I employ a rectilinear copying lens—one of Dallmeyer's—with a focal length of twenty-six and a-half inches; this gives capital reproductions up to twenty-four inches. I focus midway between centre and margin. The drawing to be copied for lithographic reproduction should have well-defined black lines, and should not be shaded with Indian-ink, or tinted with flat washes of any kind; it should be properly stretched or pinned out as flat as possible, in order that all the lines may be kept in the same plane.

Tracings on ordinary tracing-cloth can be copied, if clean white paper is put underneath. The lines should be made of a thickness proportionate to the amount of reduction required. In taking the negative, select a situation where diffused light falls upon the drawing, as when the lighting proceeds strongly from one direction the grain on the surface of the paper and the glazed ink lines give false lights and shadows in the negative, causing some of the lines and figures to be broken and confused. The size of the intended copy being determined, it is marked on the ground glass of the camera, and the drawing placed in such a position as to reflect an image which exactly fills the space marked on the ground glass; the right angles at the corners being accurately preserved, which can only be done by keeping the plane of the picture, or drawing, parallel to that of the ground glass, and the centre in a line with the axis of the lens. Small stops are used to get sharp definitions, and some point midway between the centre and outside parts of the drawing used to focus by.

The nitrate bath is of the ordinary strength, but made slightly acid to prevent any chance of fogging. The exposure in the camera should be sufficiently prolonged to get a fair deposit of silver, but should not be carried so far as to risk filling up the lines whilst developing, as one of the most essential conditions to ensure success in the subsequent operations is to secure in the negative perfect transparency in the lines representing the drawing, and as much opacity as possible in every other part.

The developing process which has given the best results is the following:—Develop, in the first place, by means of a fifteen-grain solution of sulphate of iron, with fifteen minims of acetic acid, and stop the action the moment the lines are distinctly visible. The intensifying is done by Eder and Toth's lead process. After fixing with hyposulphite solution, the film is thoroughly washed with distilled water, and is laid in a filtered solution of—

Distilled water	100	grammes
Red prussiate of potash	6	,,
Nitrate of lead	4	,,

Only distilled water may be used, for if spring water be employed, this brings about a general precipitate all over the negative.

The negative should be dipped into this bath as soon

as it is fixed, and then but a few minutes are necessary for intensifying. If, however, the negative has become dry, then it should be put to soak in water for some hours before it is put into the lead bath. Even in that case the process of intensifying takes a much longer time. For this reason it is better not to let the negative dry before it is intensified.

During the action of the lead bath, there is deposited upon the silver parts of the picture a faint yellowish-white precipitate, which makes the film appear quite white, and possesses an extraordinary amount of intensity. It is necessary to allow the negative to remain in the lead bath until it has assumed the same amount of density which you require in the end, for the next treatment with sulphide of ammonium is for the purpose rather of rendering the film permanent than to augment its density.

The action that goes on is similar to what takes place in the uranium intensifying process. The silver works as a reducing agent, and the red prussiate of potash passes into the yellow form, which then becomes an insoluble compound—ferrocyanide of lead—with the lead salts that are present. It is now necessary to convert the unstable lead compound into a permanent and, perhaps, more opaque compound, and this is done by the action of the sulphide of ammonium.

After the negative has been taken out of the lead bath, and well washed with distilled water, the sulphide of ammonium is applied. In washing, the colour of the film should almost become white; and if it is desired to know whether the washing process has been carried far enough a few drops of the rinsings are allowed to fall into a little iron developer. If no blue colouring is to be observed, then the washing has been completely successful. The sulphide of ammonium is employed in the form of an aqueous solution of twenty per cent. strength, and immediately upon its application the image becomes perfectly black. The operator waits until the image is blackened right through, and then the sulphide of ammonium is washed off with ordinary water. In this way the most transparent lines may be secured upon a perfectly black ground. Distilled water should always be used for first washing the plate throughout these operations.

The photo-lithographic paper is prepared by dissolving separately three ounces of the best gelatine ("Nelson's opaque" answers very well) in forty ounces of hot water, and two ounces of bichromate of potash in ten ounces of hot water; the two solutions are mixed together, and should then be kept from the light. When required for use, the beaker or other vessel containing the mixture should be immersed in hot water for the purpose of liquefying the gelatine, which may then be poured into a flat porcelain dish, placed within another containing hot water, and the paper is then floated in the liquid for about seven or eight minutes, the corners being lifted, and all air-bubbles carefully dispersed, so as to ensure a perfect coating; the sheet is then raised, drained over the dish, and hung up to dry, after which the process is repeated. Bank post paper is found to be the most suitable, and before its preparation one side should be marked, so as to readily distinguish the prepared surface. The whole of this operation must, of course, be conducted in a dark room.

When perfectly dried after the second coating, the prepared paper should be laid face downwards on a polished lithographic stone heated, or polished steel plate heated, and passed through the press, in order to give it a smooth, uniform surface, care being taken that no light gets to it, to ensure which, in this, as in subsequent operations, the lithographic press should be in the dark room, or used at night, or the stone may be lifted from the press, and taken into the dark room each time it is necessary to handle the paper on it, using several folds of yellow paper as backing sheets, to protect the prepared paper during the transit.

The operation of printing is precisely the same as with albumenized paper, extra care being, however, needed that no light reaches the print. As the printed parts are of a yellowish brown colour, while the whole surface of the paper is of a deep yellow, the difference between the two is scarcely discernible in the yellow light of the dark-room; but the operator must not be tempted to examine the progress in daylight. It is also of the utmost importance that the image should not be over-printed, for if the action of the light extends to the general surface of the paper, it is altogether impossible to succeed in clearing the print in the next process; if, on the other hand, the image be under printed, there is a great probability of the finest lines being rubbed away.

Inking the print is the next stage in the process after exposure, and again brings the lithographic press into requisition. The greasy ink used may be either the common litho-retransfer ink, with which by far the most satisfactory results have been obtained, or the following:—Grind together two pounds of chalk lithographic ink, and one pound of middle linseed varnish, melt in an iron ladle four ounces of Burgundy pitch, and add gradually two ounces of palm oil and two ounces of white wax, stir the mixture till it burns, and then put in the ink and varnish in small quantities at a time, stirring the whole well together. When required for use, a small portion is melted with sufficient spirits of turpentine, so as to give it, when cold, the consistence of treacle.

To ink the print, a polished lithographic stone or polished steel plate (having been cleaned with spirit of turpentine, if it has been used for the same purpose before) is charged with a very thin coating of the ink by means of a litho-roller, and the print laid face downwards upon it, and passed through the press, using a rather lighter pressure than in ordinary printing; on taking up the print it should be found uniformly covered with a thin tint of the black ink; the thinner the layer of the ink, the sharper and finer will the drawing come out.

Removing the superfluous ink is accomplished in the following manner:—Prepare some strong gum-water, and warm it slightly; pour some hot water (about 100° Fahr.) into a flat porcelain dish, and upon it float the inked print, face upwards, allowing it to remain until the warm moisture has penetrated the gelatinous film—which will be known by the appearance of innumerable glossy patches over the surface of ink—then pour off the water, leaving the print evenly spread on the bottom of the warm dish, and wash it very carefully with a soft sponge and the warm gum-water. If the gelatine is of good quality, the negative sufficiently opaque, and no light has been permitted to reach the print beyond that which passed through the transparent parts of the negative, the coating of gelatine, and with it the greasy ink on its surface, will be removed from the paper with the lightest touch of the sponge, leaving behind such portions of the composition only as have been made insoluble by the action of light, and which, consequently, also retain the ink on them, gum-water being incapable of attacking the grease and removing it from the paper, unless it can do so by first dissolving away the foundation of gelatine upon which it rests.

When all the superfluous ink has been removed the print is washed in several changes of tepid water (not so warm as before), and hung up to dry. A careful examination will now point out any errors in the foregoing process. If the fine lines which lie close together, or the angles formed by the junction or crossing of the lines, are filled in with ink, and the drawing generally appears rough and wanting in sharpness, there has been too much ink on the stone in the inking process; if, on the other hand, the lines are very sharp and fine, but extremely pale and wanting in sufficient body to transfer themselves to stone, there has been too little (a very rare fault). If the ink leaves the paper sluggishly, and there remains behind a dark scum in patches over the drawing, light has affected the paper

either through the negative being not sufficiently dense (a very likely cause), or from carelessness in conducting the operations. If the lines are broken, and exhibit a tendency to leave the paper, the print has been under-exposed; whilst if the thick lines, dots, &c., are firm, sharp, and well-defined, and the fine ones rotten and feeble, the negative itself is at fault, having its fine lines partly covered up in the intensifying process. This fault is not so easily discerned on looking through the negative as might be imagined, on account of the filling up frequently consisting of a thin yellowish veil, transparent to the eye, but chemically opaque—a fault generally due to over-exposure and carrying the development too far previously to fixing, but occasionally due to insufficiently washing away the hyposulphite of soda in each operation in which it has been used.

The transferring to stone is performed in the same manner as with an ordinary transfer, and does not require special notice.

The "Topic" next week will be "Unhealthy Dark Rooms," by Mr. George Bradtorde, of Bath.

PHOTOGRAPHY AND COLOUR, FOR EDUCATIONAL AND TECHNICAL PURPOSES.

BY T. J. PEARSALL, F.C.S.*

What I am now disposed to suggest in all cases of importance is this:—Take two photographs, place them before each other accurately so that they coincide, and then make this register certain by any means (such as marks, pinholes, &c.). Remove this second photograph, colour it on its surface, and, if need be, also colour it on the back; deepen the shadows, clear out and render transparent the lights, then exactly attach it again to the plain photograph superposed.

Now this original photograph is seen in the usual way by light reflected on, to, and from its surface. Keep off this light by a screen, and let light be transmitted from a lamp or any source of light through the photograph, and the subject can be seen as more truly portrayed by photography and colours. All the angles, lines, lights and shades, relative positions, due proportions, and indications of texture are now blended with the mass of glowing colours, flowing in harmony by means of the transmitted light, and thus, as I conceive, the want of local colour—the only blot on the true representation of nature and art by the practice of photography—may, in many cases, be efficiently removed.

As I wish to introduce for discussion this plan for employing two modes of using photographs and two modes of employing light, so I wish that the effects should not be supposed to be necessarily *painted* upon the *back* of a single photograph; but, even if such effects were sufficient, and a quantity of such representations were required, I fancy they could readily be produced by stencils, by chromo-lithographs, or even with pieces of coloured papers, or tissues, &c., may be used, and all such matters could be easily effected by the spare time and skill of young persons.

Glancing only at some few of the many subjects that may have additional clearness by this mode of representation, I may advert to the many instances of mechanism or even of entire machines be concealed by cases and coverings for protection merely. Even machines of very different metals—partly iron, copper, brass, bronze, or steel, filed, polished, or rough—may all be hidden by a coating of paint. Buildings and property may be usefully represented. Thus, walls of a garden built upon, and the ground and walling at a future time may be subject of full and painful enquiry, may be readily shown by the use of photographs and colour as here indicated, and where additions had been made upon original ground or partial buildings. Buildings on one ground leaning against a wall separating two lands may thus be clearly shown at a glance, when description would be tedious and exhausting, and written records very costly.

Last year, at the Exhibition of the Photographic Society, these photographs were shown, being Nos. 450 and 460, named as "Photography Applied to Technical Purposes." I mention this because last week an account comes from Paris of the use of pieces of coloured papers skilfully cut out and applied to photographic representations, so as to have the aid of local colours to photographic pictures.

As tasteful persons can apply coloured agents in this way, and as I recommend *two* or *three* photographs to be employed instead of *one*, I think I may fairly ask you to consider the subject and suggest applications where local colour can be employed to aid education, to help the skilful worker, to give discrimination in the researches of science, or to more impressively indicate some of the million beauties of form and colour presented to us in Nature by this closer union of colours and photography.

* Continued from page 125.

Correspondence.

ANGLE OF ROOF.

Sir,—The following information may be of use to Mr. Salmon, and perhaps others.

The meridian altitude on the sun of the longest day is 62° 30′. A studio built with the roof at this angle, and facing north, would not admit the sun, except early in the morning and in the evening. There is no objection to this angle as regards lighting the sitter, if the roof is carried high enough, and there are some advantages. For instance, the more perpendicular the roof is, the better the blinds will hang. Many studios have been built with the roofs at this angle at my suggestion, and have been found to be a great improvement over the usual roof built with an angle of 45°, or less. H. P. Robinson.

MARINE PHOTOGRAPHS.

Sir,—Some time ago I wrote under the name of "Marine," inquiring for marine photographs of a certain kind; but no satisfactory reply having appeared, I write again, feeling certain that the Photographic News circulates amongst numerous amateurs, and others, who must be aware of the existence of such pictures as I am in quest of.

In these days of gelatine films and instantaneous shutters it is reasonable to assume that some enterprising enthusiasts have attempted to take views of ships at sea, or in motion, whether in rough water or smooth. I have seen a few yachts, but I want other craft, such as steamers, ships, and the like, in motion—British and foreign craft of all kinds, Chinese and Japanese junks, Arab dhows, &c.

I have tried several London houses to no purpose, though in one, before turning away, I chanced to look over a packet of cartes, and found some foreign war-ships under sail—by which I infer there must be more extant.

My previous *nom-de-plume* being possibly misunderstood, I beg now, by your leave, to change it to

Sea-Bird.

REDUCING INTENSITY OF GELATINE NEGATIVES.

Sir,—Noticing the inquiry of "J. L." in your issue of the 13th February for a method to reduce a gelatine negative, I would recommend him to try the following:—The negative, after fixing, should be well tanned in the alum bath, washed, and dried. Then immerse in a ten-grain solution of bichloride of mercury; if the negative is very dense, leave it there till the film is bleached; then remove and wash

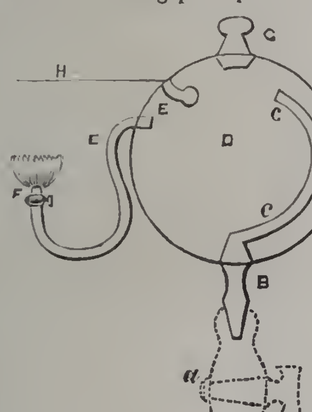
thoroughly, then immerse in a ten-grain solution of cyanide of potassium, and leave there till the reduction is uniform over the entire surface; this is easily seen, the most intense parts being the last to clear up; wash, dry, and varnish.

Philadelphia, U. S., March 3rd. JOHN CARBUTT.

PHOTOGRAPHS BY GASLIGHT.

SIR,—As I have noticed several queries in your columns respecting a cheap method of utilizing gas for lighting objects for photographic purposes, it may perhaps not be uninteresting to some of your readers if I record my experience with a burner purchased by me a few days since, and I beg to enclose a print from a gelatine negative, exposed in my sanctum for five minutes. The lens employed was a Dallmeyer's Rapid Rectilinear. The subject is a plaster cast of Hercules, and it was illuminated by the flame from one burner supplied to me by the Albo-Carbon Light Company, at a cost of about 5s. 6d. or 6s., including two pounds of composition, hereafter alluded to. I placed a white card reflector behind the flame, between it and the curved tubing carrying the burner, and I found that the power of the light was very considerably increased, and it seems to me that an ingenious arrangement of several burners and reflectors would furnish photographers with a very economical and efficient light.

The flame is small, but very white, and is produced by an arrangement on the following principle:—



A, the gas pipe from which the ordinary burner is unscrewed, and into which the cone B is dropped. C C, a tube in continuation of cone, and conveying gas into the interior of a metal globe, of which D is a section. E, bent tube conveying gas from globe to burner F. H, a flat plate of metal projecting over the flame, and attached to the metal globe. G, a metal cap, screwing into top of globe.

The screw-cap is taken off, and the globe is partially filled with a solid composition, rich in carbon, supplied by the Company. The cap is screwed on, and the socket dropped into the aperture of the gas piping A. When the gas is turned on, it passes through the hollow cone B, up the tube C, into the globe and out through E into the burner. The flame at first is like that from an ordinary jet, but as the metal plate becomes heated it communicates warmth to the globe. The enclosed composition melts, and gives off a vapour which, mixing with the gas, charges it with carbon, and a small brilliant steady flame is the result.

I may add that I have no interest in the Company, and I know no one connected with it.—I am, sir, yours,

15, *Lee Park, Lee, S.E.* CHARLES D. DAVIES.

[The photograph Mr. Davies forwards us is a full-size cabinet; it is a well-exposed picture, and its details exceedingly delicate.—ED. *P. N.*]

PRINTING BY DEVELOPMENT.

SIR,—I see that an error has been attributed to me in my formula for printing by development. In the paper we printed in the Photographic Journal, the amount of water in which the 500 grains of silver nitrate is to be dissolved is 20 ounces, and *not* 2.—Yours faithfully, W. DE W. ABNEY.

Proceedings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE fifth ordinary meeting was held in 5, St. Andrew Square, on Wednesday evening, the 3rd of March, 1880, Mr. JOHN LESSELS, President, in the chair.

The minutes of previous meetings were read, passed, and signed; and the following gentlemen were elected ordinary members:—D. P. Anderson, A. P. Brown, W. G. Slight, P. F. Richards, D. Gregs, Alex. Carrick, W. Notman, W. H. Porter, A. B. Scott, James Morrison, and James Mason.

Mr. MARSHALL WANE then read a paper entitled "Remarks on Washing Prints," and illustrated it by a large diagram of Moulton's Rapid Washer, as adapted and worked on his own establishment (see page 135).

The paper was listened to with evident interest and satisfaction.

Mr. PRINGLE said it was a nice thing to hear such papers read before the Society, as they invariably led to practical results. He had listened to Mr. Wane's paper with great pleasure, although he did not quite concur in all that Mr. Wane had stated. In his own practice and experience, which extended over a long series of years, he had experimented with various kinds of materials in printing, and he was inclined to the opinion that a good deal of "fading" arose from the use of bad albumenized German stuff made from blood, which stunk so! No amount of washing, by whatever mode, could overcome this. He remembered the different kinds of washing machines during the days of calotypes, and of the many series of trays then in use, when colour was not considered a matter of great importance. Yet, even then, the matter of colour was being recognized by the public from different points of view. In 1867 Grandville patented a rotary machine, by the use of which prints could be reduced to a state of pulp in no time (?) Then there was the automatic machine, or trough, which was a good thing, and had the advantage of being self-acting; then there were the syphon troughs and slate troughs, all of which had special advantages claimed for them. But the American machine referred to, and described by Mr. Wane, far surpassed each and all of them; it was really a capital machine, and he wondered it had not been thought of before. No doubt the public might be satisfied with the prints they get, no matter how produced, but the professional photographer should look to something more than merely giving the public work to please: the public was entitled to receive the best results which a thoroughly practical man could give, and this would bring its own reward. He considered the machine a thoroughly good one.

Mr. ALEXANDER NICOL said he quite concurred in what Mr. Wane had said regarding the yellow or buff cards: they were thoroughly bad.

Mr. NEILSON said he had examined the machine at work in Mr. Wane's establishment, and thought that there was nothing like it for perfection.

Mr. TURNBULL and the CHAIRMAN also took part in the discussion.

Mr. PILLANS proposed a vote of thanks to Mr. Wane for bringing the matter under the notice of the Society.

The second paper read was by Mr. William Neilson, entitled "Principles or Rules of Landscape Photography."

Mr. NEILSON, in a few introductory remarks, said it was to be regretted that members generally did not take greater interest in the actual work of the Society. It was, he said, surely no great matter for almost any of the members to write a paper; yet how few, alas! offered a helping hand to the hard-wrought Secretary in the way of contributions to the Society's transactions. He trusted the members would consider the matter, and co-operate with their aid the efforts of Mr. Dobbie.

The reading of the paper was quite a treat, and one which the large audience appreciated.

Mr. NORMAN MACBETH, A.R.S.A., said that he had attended the meeting purposely to hear Mr. Neilson's paper read. From past experience he knew his friend would lay before the meeting valuable and instructive matter for careful study. Such subjects as that presented by Mr. Neilson should be brought more frequently before the Society, and photographers should study them more. Mr. Neilson's ideas were correct and well-expressed. Mr. Macbeth entered somewhat fully into the subject of art, and gave a clear and easily understood definition of what it really was. Photographers, he said, should study to take the pictures when the subjects were unconscious of the

act, so as to secure repose and feeling. Pictures so produced were the most successful, and this could be accomplished without difficulty by the very rapid dry plates.

A series of very beautiful pictures were exhibited to illustrate Mr. Macbeth's idea.

The Chairman said that Mr. Neilson had no need of a book of reference to the subject of his paper: his ideas were a book in themselves. He proposed a hearty vote of thanks to Mr. Neilson for his enjoyable paper.

Mr. A. S. McKay bore testimony to the excellence of Mr. Neilson's paper, and stated that the subject was a very large one. Any one of the heads touched on might form a suitable paper in itself, and he hoped to be able to follow up Mr. Neilson's remarks by a paper treating on the same during the present session.

Mr. Dobbie and others took part in the discussion.

A number of last year's presentation prints were distributed to the members, after which a vote of thanks was given to the Chairman, and the meeting separated.

Photographic Society of Ireland.

A meeting was held in the Royal College of Science, Stephen's Green, E., Friday, 12th inst., Mr. George Mansfield in the chair.

The minutes of the previous meeting having been read and confirmed, Mr. James Simminton was duly elected a member of the Society.

Mr. Thomas Mayne exhibited a number of transparencies on gelatine plates developed with ferrous oxalate, and showed, by practical experiments, the ease and simplicity of the process. A discussion as to their suitability for lantern slides having taken place, the balance of opinion was that the natural opacity of a gelatine film prevented a great part of the light from passing through, and that consequently more perfect slides for lantern work could be produced with wet collodion.

Mr. J. V. Robinson communicated some further results which had been observed of the photographic power of phosphorescent light.

It having been arranged that the April meeting would be a "lantern evening," to which members were to have the privilege of bringing their friends, the proceedings terminated.

Photographers' Benevolent Association.

The Board of Management of the Photographers' Benevolent Association held their monthly meeting at 160a, Aldersgate Street, on the 3rd inst.

Mr. W. Cobb (of Woolwich) was elected an honorary member of the Association; and Mr. Knight (of Plumstead) was elected an ordinary member.

The Board having disposed of the minor business, the meeting adjourned till April 7th, at 8 p.m.

To Correspondents.

*** To Agents and Advertisers.—Next Friday being Good Friday, the Photographic News will be published on Thursday, March 25th. Advertisers should send in their Announcements not later than Wednesday, March 24th.

*** Erratum.—In our "At Home" last week, Mr. Francis Dann should have been described as an ex-sergeant-major of the Royal Artillery.

J. S. Milner.—The Rapid Rectilinear is rather more than *four* times quicker than the wide angle. The ratios between aperture and focus of the particular lenses in question are, we believe, 1-7th and 1-15th. Square the denominators, and you have the comparative rapidity, viz., 49 : 225.

R. Pease.—You may insure your apparatus and stock quite as well as your house or studio. Payments for fire insurances fall due on Lady Day.

Cardinal.—Never; unless you choose to part with the copyright yourself.

Nabob.—Mr. Earl, of Worcester; but he has not exhibited at Pall Mall lately. The Windsor Castle view you mention is one of Vernon Heath's series, and is published by him; apply at his establishment in Piccadilly.

H. Stone.—They do not sell privately, but through publishers. Apply to Marion's.

Morse.—If you coat the bare glass with albumen, it is enough. Painters of magic lantern slides generally use albumen, in order to get the glass to take the colours.

Richard Blake.—You will find the iron printing process to which you refer, detailed in Photographic News of 5th inst., in Answers to Correspondents, under name of F. Morris. Send to our publishers for it.

Semper Fidelis.—Silver stains on fabric are best removed by the aid of iodine solution. Make a solution of iodide of potassium in water, and dissolve a few crystals of iodine in it. Apply this to the stains, rubbing solution well into fabric; this changes the silver into iodide of silver. Then wash with hyposulphite of soda, which soon removes the iodide. Finally, rinse in water.

Omega.—We fear that collodio-chloride paper is not in the market, if you cannot obtain it from your dealers. Obernetter, of Munich, used to make it. Mawson and Swan can supply you with it in emulsion, if not on paper. We do not know if *cliches* for backgrounds are sold by the trade now, but they were once a commercial article. We will inquire.

T. Nworb.—Are you working in a studio or in the open? The symptoms you describe are those of under-exposure and over-intensification. Expose for a longer period, and do not intensify; or, better still, try two plates, exposing one, say, twenty, and the other forty seconds, and develop them in precisely the same manner. From the fact that you get clear plates, your bath is in good order. Is your developer too strong?

Stephen.—Then why do you do it? Use less alcohol.

Morose.—1. Very often. 2. Do not use a lens with so wide an angle.

Printer.—We think you could claim a week's wages; but have you told us all the circumstances?

G. T.—Meagher has made us a very good one, which works well; at any rate, it is better than another form in our possession. Consult him. Thank you for the sketch, which we hope to insert in the News. We presume the late Editor's illness was the cause of the description not appearing. The photograph you send of the ravages of the hailstorm is very vivid.

H. G.—We will treat the subject of registration shortly, and thank you for the suggestion. It is not absolutely necessary to register before publication, but any one may copy if you have not registered. Painters come undr another law, photography being allied to designs, drawings, &c., you have no remedy at present, if you do not register, but the new Act will alter matters. We think you *must* have the word "copyright" or "registered" on every copy of your picture, but we are not quite sure on this point.

A. B. C.—We cannot answer by post. We think from general aspect of your print that there is very little the matter with your bath. We certainly do not think it is over-iodized. If you employ good nitrate of silver, there should be no reason for adding nitric acid at all. We are inclined to think the fault is with the collodion. Have you a good ripe sample—not freshly mixed—that you can try? Never doctor a bath unless it is absolutely necessary; we believe you will find that particles in the collodion are at fault.

Doubleyou.—The method has already been suggested for making a very pure and soluble gun-cotton for collodion, but the question is, do you gain anything by it? The pyroxilin is dissolved in alcohol and ether as usual, and the clear portion decanted off. To this you add water, which throws down the gun-cotton again; this is collected and re-dissolved once more in alcohol and ether to make collodion. There is no doubt about it, that you get a pure and very soluble pyroxilin in that way.

Panel Portrait.—Yes, it is the promenade. We have seen it at all the fashionable studios we have recently visited, and certainly think there is a future for it. The mounts are a little expensive, as you say; perhaps the cost of those may be reduced, but the picture must not lack finish. Don't spoil the ship for a ha'p'orth of tar.

A. W.—Yes; it was a stupid slip of the pen. It should have been Chappuis of *Fleet Street*.

W. Morris.—According to Mr. Swan, you should never print a gelatine negative without varnishing; at any rate, it is not a safe operation, unless frame and pad are "as dry as a bone."

Several correspondents in our next.

PATENTS.

COMPILED BY MR. DES VŒUX,

Patent, Trade Marks, and Photographic Copyright Office, 32, Southampton Buildings, Chancery Lane, London.

No. 1054. John Chadwick and William Isaac Chadwick, both of Manchester, in the County of Lancaster, "Improvements in Apparatus for Controlling the Exposure in Photographic Operations." Dated 11th March, 1880.

No. 1093. James Mountstephen Rogers, of Kingsland, Middlesex, "Improvements in the Arrangement and Construction of Apparatus for Holding and Exhibiting Photographs, Cards, Pictures, and similar Objects." Dated 15th March, 1880.

The Photographic News, March 25, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE ELECTRIC LIGHT AND VEGETATION—THE LONDON WATER SUPPLY—MICROSCOPIC MEASUREMENT OF BROMIDE OF SILVER IN GELATINE EMULSION—PHOTOGRAPHY AND ELECTIONS.

The Electric Light and Vegetation.—We have never done with the electric light now-a-days: horticulture is next to reap a benefit from it. Dr. Siemens read a paper to the Royal Society, in which he proved that by turning night into day in his conservatory, he was able to aid the growth of various early vegetables, including beans, peas, mustard, and potatoes, whilst the blooming of flowers was absolutely exemplified before the scientific senate by his exhibiting a pot of tulips in bud, and after forty minutes' exposure to light showing them in full bloom. Whether this action is due to the light, or to the presence of an electric current in their vicinity, it seems, is open to doubt, for in India it is affirmed—and with some reason, apparently—that a thunderstorm is necessary to cause bamboos to shoot well. As regards the growth of plants when above the ground, it has over and over again been shown that the yellow and blue rays have a marked influence in causing the formation of chlorophyll, on which, in a measure, the growth of plants depend, and by the electric light we have these rays supplied in abundance. The conclusion that is drawn by the author of the paper coincides with that of Dr. Schubeler, of Christiana, who experimented on plants in an Arctic summer. This shrewd and observant philosopher stated that under the influence of continuous light, plants are able to grow continuously and develop more brilliant flowers, and larger and more aromatic fruit, than under the alternation of light and darkness. The formation of sugar, on which the ripeness of the fruit depends, is simply caused by the elevation of temperature. What the influence of the light may be on seeds below the surface of the soil is an open question, and is not decided by Dr. Siemens at present. The electric light has, we believe, also been utilized in the study of vegetable physiology. It is well known that in certain plants (exotics principally) the leaves stand well out from the stem during daylight, but gradually droop as the light declines. Drawings have been made of these nocturnal positions, but photographs have also been considered necessary to verify the accuracy of the drawing. To do this, an electric light has been used to illuminate the plants when they were well asleep, and with the best of results. In some negatives we have seen, the light has been turned on just a trifle too long, and before the exposure was finished, the plants begin to awake, and the leaves commenced ascending to their proper daylight position, the consequence being a slight blurring or indistinctness of the image.

The London Water Supply.—It is a mercy to us poor ratepayers that Parliament is dissolved without having passed Mr. Cross's little Bill (it would have been a big one, by-the-bye, for us to pay), by which we were to have obtained pure water in the future; the future being—well, we won't say how long hence. Now, of all people in the world who should be benefited by a pure supply it is the photographer, since so much is dependent on it in his operations. We Londoners, however, have not much to grumble at; the water is tolerably pure after it leaves the filter beds of the different companies' reservoirs, much more so than is generally believed. London water is infinitely better than most well water, even when the latter is stated to be chemically pure. We know of one instance where a succession of families, all inhabiting a certain house, drank the well water, and the majority of them died from typhoid fever. The well water was analysed and found excellent, and yet a microscopic examination of a slight sediment there was, showed the scales of fish fibre and a few more organic substances quite undetectable by chemical means. The presence of these minute forms show that sewage leaked into the well very slowly and in a very dilute form, and yet the poison left by one family was sufficiently virulent to poison the next. In another case a well-known photographer was suddenly afflicted with spots in his plate—spots of a circular form, darkening on the metallic image *after* he had fixed his plate. These plagues appeared suddenly, and nothing would move them. An examination of the water used for washing showed at once what was the cause. The well water contained a certain amount of iron in solution, and the chloride of sodium and other salts soaked into the water from an adjoining cesspool, owing to an overflow caused by heavy rains. Perchloride of iron was formed, and after washing the cyanide away, used for fixing, it speedily attacked the least resisting parts of the image, forming chloride of silver, and naturally these darked by exposure to the light. Nature had here shown the photographer how he might reduce the intensity of his negatives, but, instead of taking the hint, he blamed his bath, his developing solution, and cyanide, and never thought of the water. Even if Mr. Cross's Bill does not pass, we are never likely to get water so impure as that. No doubt, water drinkers in London swallow thousands of animalculæ of all sorts, but usually they are of the most harmless description, and they don't affect the sensitive plates or developed images. We can well rest content with the rates we pay now, and, we may add, the water. The only improvement that we can suggest is that there should be two supplies, one for drinking, carefully filtered by the very best means before it reaches the houses; and the other, in its natural state, for the ordinary purposes of the house. It seems a waste of money and labour to filter, as is done now, *all* the water which is used for ordinary domestic purposes.

Microscopic Measurement of Bromide of Silver in Gelatine Emulsion.—The indefatigable Dr. D. J. M. Eder has had recourse to the microscope to tell us rather more than we knew before regarding the sizes of the bromide of silver particles which are to be found in gelatine emulsions. The extreme minuteness of the particles can be judged when it is stated that the limits are somewhere about 1-30,000th and 1-10,000th of an inch, according to the length of time that the gelatine has been cooked; the longer the cooking, the coarser being the particles. No doubt the Doctor measured these in his microscopic micrometer, and with all that accuracy which distinguishes his countrymen. It is not every one who has a microscope, however, who has the necessary delicate measuring apparatus; and, perhaps, a rough method of approximately ascertaining the size of these minute forms may be acceptable. Tie your forefinger rather tightly round with your handkerchief so as to cause the blood to be forced to its top, and take a fine needle and give it a small prick. A drop of blood will immediately exude, which can be spread by the needle point on the same strip of microscopic glass as that on which the object to be examined has been previously placed. On examining this drop of blood with a quarter-inch objective and a tolerably low power of eyepiece, the blood corpuscles can be readily seen. The corpuscles look like small jelly-fish floating about in a fluid, and their longest diameter is about 1-3,200th of an inch. By keeping in the mind the apparent size of these small bodies, and then examining (say) the particle of bromide of silver, a very fair approximation to the size of the latter can be arrived at. Perhaps one point requires caution—and that is, not to come within the clutches of the law, and to avoid this it is as well to prick your finger in private, and get the blood on the plate before any one sees you. According to the literal wording of the Act which prohibits vivisection, such a maltreatment of your own finger, or of any one else's, renders you subject to penalties which are almost too terrible to enumerate.

Photography and Elections.—A very clever application of photography to electioning purposes is being made in some electoral districts and towns. It consists of presenting a carte photograph of the candidate to each elector, on which

is printed : " Your vote and interest is requested for ——." This is decidedly a happy idea, since the canvassers are able to bring, face to face with the candidate, all the electors, even those who are unwilling to go through the ordeal of a public meeting. There is the advantage, too, that the candidate is shown at his best. The excitement of the platform gives place to the calm of ordinary society, and the nervous and usually ugly tricks with the hands, legs, and arms, or with all, which so often are seen during the "stump," cannot be imagined as possible in the polished individual pourtrayed in the photograph. More than one vote has been obtained for a candidate whose forte was not speaking, but being good looking. The daughters say, " He's a duck ; " and the mother says, " Well, he do look a gentleman ; " and the father, the voter, gives in—he's not a home ruler !

ON THE REDUCTION OF COLLODION AND GELATINE EMULSION RESIDUES.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.*

The question has often been raised as to which is the best plan to recover the silver from the waste gelatine emulsions. I have seen it stated that there is nothing for it but to dry the emulsion and burn it. This, to say the least of it, is a tedious plan, and not one which I can recommend by theory or practice. A much neater method may be adopted, and one which is so simple that any one may carry it out. If a solution of gelatine be boiled with a solution of caustic potash or soda, it rapidly loses its viscous character, and becomes incapable of holding any matter in suspension. It is on this principle that the silver residues from gelatine or collodion emulsions can be utilized without resort to the crucible, except for a very minor operation. The waste gelatine, or collodion emulsions or films, are collected, and when a fair quantity have accumulated they should be placed in a boiling flask or dish, and well covered with a saturated solution of caustic potash (commercial will answer admirably) or soda. The flask or dish should then be warmed gradually till it is in a boiling state, but care must be taken to prevent the solution boiling over, as it is liable to do if the heat be intense. It will be noticed, as the operation proceeds, that the liquid mass becomes of a deep brown to a black colour. After this occurs the boiling should be continued for a quarter of an hour, after which time it will be found that the whole of the solid matter has been dissolved and the silver bromide has disappeared. The liquid may be filtered through filter-paper, when the filtrate should be nearly colourless, leaving the black colouring matter in the filter paper. It may be found necessary to pass the first part of the filtered solution once or twice through the filter paper to attain this decolourized liquid, but when once the drops are colourless the whole of the remaining solution, when filtered, will do so. If time be no object, the solution, instead of being filtered, may be allowed to settle, and the colourless liquid can then be decanted off, merely the last traces of liquid being filtered off from the residue. This residue consists principally of metallic silver with a little organic matter present. If it be well washed in the filter it may be dried and placed in a small crucible over a Bunsen burner till all organic matter has been burnt off, and be treated with dilute nitric acid to form silver nitrate, or it may at once be treated with the acid and, after filtration again, it may be precipitated as chloride and added to the ordinary residues. The rationale of the process is evident : the gelatine or collodion, caustic potash, and silver bromide are respectively the organic matter, the alkali, and the metallic salt, which are placed together to reduce the last to the metallic state. The same principle is used for preparing silvering solutions for silvering mirrors, where we have sugar, potash, and ammonio-nitrate of silver ; and it is the same also for alkaline development. The process is really very simple, and easily carried out.

* Communicated to the Journal of the Photographic Society.

At Home.

THE WOODBURY PERMANENT PRINTING COMPANY AT KENT GARDENS, EALING.

In a remote corner of Ealing, where the surburban villas come to an end, and the meadowland slopes away to the green hills about Harrow and Pinner, are to be found the works of the Woodbury Permanent Printing Company. The Company has evidently a notion of taking care of itself, for at Brompton, we remember, where it was last located, the neighbourhood was an exceedingly agreeable one, and there are certainly few working establishments in and about London which can boast so fine a site as Kent Gardens, Ealing. The building is nothing less than one of the fine villas that are here to be seen in goodly number, or rather, we believe, an hotel, it is so spacious ; the rooms are light, airy, and lofty, and the grounds amply suffice for the outhouses—printing sheds, studios, developing rooms, &c.—which are necessary to the carrying on of the multifarious duties with which the Company occupies itself.

The Company produces its own carbon tissue, for, as our readers are aware, it has acquired for some years past a high reputation for enlargements printed in permanent pigments, and possesses all the necessary facilities for printing and developing ; but, as a matter of course, it is the photo-relief, or Woodbury, process that constitutes the chief feature of the Kent Gardens establishment. The Company has it all its own way when it comes to a question of rapid printing from portrait negatives, and, what between electioneering orders and orders connected with Royal marriages, there is plenty to do just now. Election agents are very much alive to the publicity which photography is capable of giving to the features of the respective candidates, and orders are sometimes given for as many portraits of a would-be member as there are voters on the election roll. Again, the daughter of King Rumpeltiltskin is a favourite just now, the Princess Badoura, for she is shortly to be married, and Continental dealers are clamouring for her portrait. Comes an agent across the seas with a couple of negatives of the fair Princess ; he will not leave them—they are too precious—but waits uncomfortably for a few hours at Ealing, while the necessary gelatine moulds are made for printing off the pictures mechanically. Then he travels back again post-haste to continue solar printing, which has been momentarily interrupted, leaving behind him instructions to despatch 50,000 copies of the fair Princess as soon as Ealing has stamped them off.

Our readers are well acquainted with the Woodbury process, we know, but we shall nevertheless take the liberty of briefly describing it once more as it stands in its present state of perfection. The first room is where the sensitive film is kept. It is in thin transparent sheets, and consists of gelatine with a backing of collodion treated with bichromate solution ; it very much resembles the gelatine employed for cracker bonbons, only it is tougher and a little stouter. After sensitizing, it is put into a chloride of calcium box to dry, the operation being there very steadily and thoroughly carried out. The sensitive gelatine film is put under a negative in an ordinary printing frame, and printed in the sun. They used, at Brompton, to put the printing frames at the bottom of a box, to ensure the rays coming straight down upon the film ; but this they find is not necessary if the frames are made to face in the direction of the sun. But direct rays are indispensable to the production of a good photo-relief. The gelatine film, by printing under a negative, becomes insoluble in parts (where the light has got at it) and the consequence is, that when immersed in warm water, only a portion of the film washes away, leaving an image of the negative in relief. The washing takes place very gradually, the film being placed on end, and the

water passing through. The shadows in the negative being represented by transparent patches of glass, the light has worked through here, and the result is that the gelatine film is, after washing, all over prominences, these prominences being the shadows; and they are more or less in relief according as the shadows were deep or otherwise, or according, as we have said before, the glass negative was more or less transparent. These gelatine impressions are permitted to dry upon patent plate glass so that they may be perfectly flat, and are further toughened with alum. Stripped from the glass when dry, we have a perfect mould, in which the shadows are represented by prominences, and the lights by hollows.

Now comes the production of the metal plate, which is taken from this gelatine mould. There are two hydraulic presses in this room for pressing the gelatine mould against a sheet of lead; one of the presses is capable of exerting a pressure of 150 tons, and the other, which is employed for pictures up to 14 inches by 10, is equal to giving a squeeze of 500 tons. It is the necessity for having these presses which evidently stands in the way of Woodburytype becoming vulgarised; that is to say, photo-relief printing is of itself such an elaborate industry, and requires such expensive apparatus, and withal the employment of so many skilled hands in the one department and another, that unless a photographer sees his way clear to issue hundreds of thousands of prints, it would never be worth his while to take up with the process; at any rate, not until some more inexpensive means of securing the metal printing plate is devised, is the portraitist likely to turn his attention to photo-relief printing.

Pure lead is employed for securing the counter-mould of the gelatine film, the lead being rolled into plates. A steel plate serves to rest the gelatine mould upon, and this steel plate forms, as it were, the bottom of a tray, the sides of the tray being sharp knife edges. The reason of this tray-like formation is soon evident. The gelatine mould, as we say, is put upon the steel bottom of the tray, and then a sheet of lead, larger than the tray, is put upon it. When subjected to pressure in this way, the knife edges cut the lead, and the latter thus accurately and entirely fills up the tray. The gelatine film cannot escape the pressure, because of the steel plate below, and the consequence is that the lead is pressed into every detail of the gelatine, and these details cannot spread, because the tray is completely full of metal. The consequence is, that the comparatively frail gelatine impresses the metal plate with its likeness. The pressure is so evenly and skilfully managed, that they say a fern leaf can be put in the tray and pressed; and the fern leaf, soft and yielding as one might suppose, is still capable under the circumstances of impressing its form on the metal.

We have in the lead plate an engraving in which the shadows are now represented as deep hollows, and the high-lights by prominences; indeed, the deeper the shadow in the original photograph, the deeper are the cavities. We now proceed to another room to see the process of printing from these metal plates. It is a large apartment with eight circular tables. There is a printer at each table; the table revolves on a pivot, so that he can bring under his hand, one after another, a series of printing presses, of which there are seven to each table, fixed round the margin. The process of printing consists in the fact that you employ a dark transparent ink, and the thicker the layer of this ink upon paper, the blacker it appears. The printer opens one of the presses, and you see, face upwards, the metal plate; he pours a little pool of the warm gelatinous ink upon the plate, claps a sheet of white paper on the pool, and then, with a turn of the handle, makes the paper press down upon the plate. The result is that the superfluous ink is squeezed out, and when you open the press again presently, there is an image made up of ink of different thicknesses. The hollows in the plates have permitted a good deal of ink to remain, thus representing the shadows of the picture, while in the lights nearly all the ink has been pressed out, and in these portions the paper is white—or almost white.

As we have said, each printer stands before a round table that revolves. He has seven presses to attend to, and inks them one after another; a minute, or rather more, is consumed at each revolution of the table, so that the gelatinous ink of each picture has this time to set. They are printing a portrait of Miss Genevieve Ward at this table, as she appears in "Forget-me-Not," at the Prince of Wales's; it is for a coming number of the *Theatre*. The printing goes on very fast; a wine bottle, kept warm in a water-bath close by, holds the ink, and from this it is poured upon the shining metal. There is a dirty pool of liquid, and a white sheet of paper clapped upon it; a turn of the press, and the moment afterwards the pool and the paper are converted into four Miss Genevieve Wards, all looking as stern as stern can be, but as fresh and perfect as a clean silver print. The inking goes on, the table revolves, and the Miss Genevieve Wards accumulate, until a boy carries them off to a canvas tray to dry, of which there is a perfect stack in the department; 30,000 cartes can be here printed in a day.

Only the purest pigment obtainable—Indian ink—can be employed in the printing of Woodburytypes, for accidental particles of pigment, however small, would ruin the pictures if they appeared in any of the high-lights. The process, so far, looks simple enough, but in practice there are many difficulties to contend against. The matter of securing perfectly good prints depends upon the printing surfaces being perfectly flat. Any unevenness of the paper is enough to spoil the picture, for as the printing is simply the accurately pressing out of superfluous ink between paper and plate, if these are not both perfectly level, one side of the print will have more ink than the other, and hence the picture will be dark on one side and light on the other. Great care is, therefore, taken to flatten the paper used in printing. It is pressed between steel plates, and, moreover, varnished and gelatined to prevent the ink subsequently being pressed into the pores of the paper, for the Woodbury print, to be successful, must be a true surface print.

In other rooms, the drying, aluming—for the gelatinous picture requires to be tanned to render it permanent—sorting, flattening, and mounting take place. The Woodbury Company gives employment to something like sixty hands, and this number will soon be further increased, for the managing director, Mr. Whitfield, contemplates extending his carbon tissue manfacture, and having an electric light, with suitable engine on the premises, for helping in his work. The Company appear to do anything and everything in connection with photographic printing. From Mr. Whitfield's well-known work "Men of Mark," down to all sorts of advertisement and show-cards, executed in thousands, for wholesale houses, the Kent Gardens establishment occupies itself. Here are pictures of rifles, fowling pieces, vases, shirt-fronts, fenders, fire-irons, neck-ties, pianos, &c.—photographs produced by the thousand. We peep into the glass house for a moment, and cannot repress a momentary shudder at the uncanny appearance that meets the eye. First of all, it looked like a group of personages perfectly immovable; then it resolved itself into so many heads, hanging lifeless, a sort of Blue Beard's chamber, and it is only on a second glance that we perceive it is but a collection of head-dresses, with no heads in them at all. Our guide evidently notices our scared look, for he says: "Oh! that's nothing; we had a hearse here yesterday."

The Woodbury Company are famous, as everybody knows, for their transparencies for the lantern; but the season for these is now over. Photographers frequently send a whole series of negatives to be made into lantern slides (sufficient for an hour's lecture or entertainment), and during the autumn and winter months work of this kind is one of the Company's chief occupations. The

transparent gelatine ink is thoroughly well adapted to the magic lantern, and permits the light to pass far more freely than it can do through the opaque particles of a silver positive.

The next "At Home" will be "At the Criminal Investigation Department, Scotland Yard."

ART AND NATURE AS REPRESENTED BY THE CAMERA AND THE BRUSH.

BY W. H. DAVIES.*

I have entitled my subject "Art and Nature as Represented by the Camera and the Brush." The first suggestion of the idea occurred to me while passing along Sauchiehall Street one day last autumn, and there seeing prints from rapid negatives of rural life—animals in motion and other kindred subjects—from the camera of your worthy Secretary, Mr. J. McGhie.

Until recently this class of subjects has been confined within very narrow limits, and, in fact, been barely possible to be represented by the photographer; but now such things have come within the limits of possibility and of ordinary operative work. 'Tis true that as all good gifts are apt to be misguided, misused, or illused, so has this gift of extreme sensitiveness been; and, as will be seen by the illustrations, here and there the sensitiveness has not been guided by the artistic sense or instinct. The instruments used to record the results have not been in every case of the quality or kind needed, and they necessarily are wanting in that perfection and precision which conduce to artistic excellence. The pictures, however, will tell for themselves that there is a new and a great future opening for such of our brethren as may care to devote themselves to this class of work—a class or description which has hitherto found few delineators; but those few will undoubtedly be increased by the exhibition this evening of the studies from nature we will be able to exhibit, and also by that keen desire to excel, which is the gift of nature to our race, and without which we would remain devoid of aspiration—without hope, without ambition, without excellence, and, therefore, without success.

To give this idea greater force and vividness is my desire this evening, and with the concurrence freely granted by the artists we will show how the brush and palette depict ordinary life and motion—life, I mean, of the rustic and, presumably, picturesque type—and how we gentlemen of the blackened fingers try to do likewise.

I need not say that there must be a wide divergence; each of us tries to represent as best he may that phase of nature he wishes to depict. We slaves of the absolute truth *must*, however we may arrange, give those truths as they appear without one atom of the imaginative power the artist can bestow upon his subject. Think for a moment upon the power of the imagination—the power which gives to the artistically-cultured mind and hand the ability to grasp and the capacity to represent what may have been only the action of a second. Think, also, of the difficulty of such work, and when you see it—even if only fairly well represented—give the artist the full credit for attempting the representation of that which is at best an extremely difficult, if not an impossible, thing to do. Let me ask my brethren of the pen and pencil to look kindly on the efforts of their more purely mechanical *collaborateurs* of the camera in their efforts in this direction. That the same quality of brain-power is needed in these cognate arts of representation is, we may presume, a settled fact; but the same subtle power of handling—the same capacity for depiction by hand—is not present. Though there may be quite as much of the feeling for the beautiful, yet we must freely admit that there is an inexpressible something the brain and hand supply, even in an absolute copy of nature, which the more mechanical delineator fails to grasp, and his work, as a consequence, must fail in reaching the same standard of excellence. But it does not, therefore, follow that the delineations of the camera are devoid of merit—or, I may say, of great merit—especially in the direction of recording the fleeting and ever-shifting effects of nature; and that it has this quality will be made evident by many of the pictures I will be able to show this evening.

I would not have our brethren of the pencil to suppose for a moment even that those picture of what I may call "nature in action" are accidents. They, you may be assured, are not so. In the great majority of instances they are the result of careful study, of skilled aptitude, and of exquisitely-delicate manipulation and appreciation of what has to be done—the time when, and the way and method of how, to do it. It is, in fact, the making use of a different alphabet or language, and all pictorial art is simply the expression of the sentiments of the artist xpreessed as best they may be in the different media chosen; but all media are not equally well fitted for the purpose, and hence the variety of results. Man does not think less clearly in French than he does in German; in Chinese or in Tamil than he does in English, though in each of the modes of expressing his thoughts he has his difficulties. How often is it that the clearest-headed of us finds a difficulty in giving expression to a passing thought! Language—even that to which we have been born, and in which, as one of the accidents of nature, we are trained to think—will occasionally fail to bring the necessary form of words to give precise expression to the fleeting thought.

As it is with the tongue and the pen, so it is with the pencil, the chisel, the brush, and the camera. All the graphic and plastic arts are but different languages, giving expression in different and, it may be, modified forms and modes of expression to that desire which the artistic mind feels necessary to convey to the external world what it thinks and how it feels, and what it sees worthy of recording is the direct product of the imagination; and this is the sentiment that impels the artistic worker to execute his work. Whether he is paid for it or not, *he* must tell the world at large what great ideas, or grand thoughts, or fine sentiments, or delicate perceptions he is gifted with; and this high, this noble sense which has done our race the truest service, is one of the highest given to man. It is the first and most direct appeal to the souls and sentiments of the world who live outside of art.

It is a strange thing to think and find that 2,000 years before photography was thought of, the actions of men and of animals, including those who were supposed to be both, were so carefully studied, modelled, and depicted that to this day no painter, photographer, or sculptor has been able to approach, far less to excel, the works of Phidias and (I should, I suppose, call it) his workshop. I say this because we know that it must have been impossible for any one man to carry out, with his own hand, the ideas his brain shadowed forth; but he must have taken *care* that his ideas were carried out by those capable of doing so. Did I not say that imagination was the supreme power?

It is in this direction that I ask my brethren of the pen and pencil, the camera and the palette, the marble and the burin, to exercise the gifts they are provided with, and give to the world, not what any simple copyist can give, whether he work in colour or in black and white, or in ink or otherwise; but rather let the little world in which we or they move see what can be done, and so show that Ha in our limited sphere is carrying out the life's work we are sent here to do—that of working so that our work shall be a benefit and improvement to our fellows as well as to ourselves.

*Condensed from a communication to a "popular" meeting of the Glasgow Photographic Association.]

ARE GELATINE PLATES SUITED FOR LANDSCAPE WORK?

BY H. MANFIELD.*

The gelatine process has made such progress lately that the most conservative of photographers cannot but admit certain of its claims. Still, though the portraitist is beginning to understand its value, the landscape worker generally hesitates to depart from the beaten track that has served him so well, and puts the question that heads these remarks, "Are Gelatine Plates Really Suited for Landscape Work?

To answer this question satisfactorily will be my endeavour this evening, for it is generally considered that for landscape work the results of gelatine will not compare with those of wet collodion, though for portraiture its advantages are more readily acknowledged, and the resulting negatives are equal, if not superior, to those from collodion films.

If gelatine be successful in the one case, why should it not be so in the other? Simply, I think, because the process is not sufficiently studied in this direction, and an unsuitable emulsion, therefore, employed. The landscape photographer uses his chemicals in an essentially different condition from those of the portraitist—a bath that is acid, a collodion that has been iodized for months, and a developer that has been mixed much longer, leave rapidity out of the question; in fact, the landscape man never thinks of such a thing, well knowing that the quality of his negatives would be sacrificed were he to attempt it, and that the harmony between his foreground and distance, and the brilliancy of his picture, depend as much upon the condition of his chemicals as that of the atmosphere, and so he modifies his formula to secure certain results.

But not so with gelatine. Films, as a rule, are taken into the field that require scarcely a tenth of the exposure that is necessary for a wet plate, and to which an extra second or so makes all the difference; even should the exact time have been hit upon, there is, more often than not, a want of brilliancy or "sparkle" in the finished negative; this is most noticeable when the plate has been exposed without sunshine, and considering that direct sunlight is anything but an advantage to many of the best subjects for photography, this obstacle alone (were it unsurmountable) would be sufficient, and justly so, to cause the rejection of the process.

Landscape negatives made from rapid plates are mostly wanting in contrast, have smoky shadows, and will not give brilliant prints: but this is by no means characteristic of gelatine, any more than fog or stains are of collodion, Gelatino-bromide of silver will give delicate negatives with clear shadows and general brightness, and an amount of detail unequalled by any other process, but it must not be in the form of an "over-cooked" emulsion, where everything is sacrificed to rapidity. An emulsion with free bromide slightly in excess, that has been "cooked" for about two days, and containing a large proportion of gelatine, gives in my hands films that fulfil the above conditions, and require about the exposure of an ordinary wet plate. I need not go into details; many reliable formulæ have been published which the worker may modify to suit his requirements, but I do not think he should omit the prolonged digestion of the emulsion: undoubtedly it has much to do with the delicacy and cleanness of the negative, unobtainable, I fancy, by any other means; indeed, should there be any doubt upon this point, it is easily settled by preparing a small quantity of emulsion, washing one half after digesting it for a few hours only, and "cooking" the remainder for two or three days according to taste. The difference in the general character of the two batches of plates is surprising, and will bear out all that has been said by other workers on this point.

The proper development, too, of gelatine plates has much to do with their success, and failure often rests with sticking to a hard-and-fast rule, or to some particular method merely laid down for general guidance. It is well to remember that a marked difference exists between aceto-iron and alkaline development. And providing that, for landscape work, the merits of gelatine be equal to those of wet collodion, the question naturally presents itself as to the advantages of the former method. Surely they are sufficient to justify attention. The bath is not generally admitted to be a pleasant companion in the field, nor are the fumes of collodion in a closely-confined tent, I believe, considered to be altogether enjoyable; but though such matters may not be pleasant, their absence is of small importance compared with the advantage and uniformity of dry plates. To be ready for any formation of cloud that may improve our picture, a figure, or even cattle in a landscape, or a boat on a lake, all of which usually depart from the scene before the plate can be got out of the "bath," is, I think, of the greatest advantage. What knight, too, of this most trying fluid, has not toiled wearily on a hot summer's day between his camera and far-off tent, to find the precious plate dry on his arrival, or waited patiently for the sun to shine, or the reverse, whilst his plate rapidly spoiled in the slide? And who has not experienced many other trying instances of like nature? Maybe these *slight inconveniences* make us prize success the more, and give an additional zest for our delightful art-science. But I doubt it.

Granted that the dry method *has* advantages over the wet, the development of the negative on the spot is a point which the wet plate worker urges, perhaps, more than anything, and with a good deal of justice. A slight error in exposure, or in the position of the camera, cannot be corrected when one is miles from the spot, but another plate exposed for a few seconds more or less, or a small alteration of the subject on the focus screen, often gives a perfect negative in place of a faulty one. Why not (with the gelatine process) combine the advantages of both wet and dry methods? A lighter tent than usually employed for the former will be found sufficient; a watertight bath of ebonite, containing the hypo in crystals, a developing tray of the same material, and a few small dropping bottles complete the outfit, easily carried by an assistant if the plates are of moderately large size, and capable of assuming the knapsack form for plates up to $7\frac{1}{2} \times 5$. Thus the negative can be completed on the spot, and, to quote a familiar expression, "you don't leave the ground before you know what you've got."

Failure occurs, I regret to say, with gelatine plates just as with other processes, and fog, or frilling, may put in an appearance; but such defects are "technicalities" which may be avoided with a little care, provided the emulsion consist of pure gelatino-bromide of silver, without the addition of organifiers or other compounds—chrome alum, perhaps, excepted. I speak from painful experience, having suffered in this direction; and a friend of mine exposed in Norway last summer four dozen plates obtained commercially; not one of these plates came back that could be printed from, all being entirely ruined by spots caused by the action of the atmosphere on some composition in the film, whilst other plates, consisting of pure gelatino-bromide, were not affected in the least.

I must apologise for the scarcity and condition of the prints that accompany these few remarks, owing to an unfortunate mistake on my part as to the date of this meeting; and, from the same cause, I regret to have been unable to place before you, as I intended, observations concerning gelatino-bromide that would, perhaps, have proved more interesting than these desultory remarks; but I trust they may be the means of calling forth some experience of value from the members present on so interesting a subject.

* Read before the Bristol and West of England Amateur Photographic Association.

The Photographic News.

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FIXING AND WASHING SILVER PRINTS.

Mr. Marshall Wane's able paper on the subject of washing prints, which was read at a recent meeting of the Edinburgh Photographic Society, is likely to call attention once more to a very important matter. There are many who profess a firm belief in the stability of silver prints, if only properly washed, but none, unfortunately, can say how perfection in this respect is to be secured. Mr. Marshall Wane, like Mr. England, and several others who have recently favoured us with a description of their method of washing, is an agitator; he believes in prints being kept in constant motion during washing, and not simply subjected to a quiet stream of running water. Mere soddening for hours together does not meet his views, and we may take it that the majority of photographers are in accord with him. At the same time we must not forget that sometimes all the washing in the world will not prevent pictures from going yellow. Mr. Wane spoke, and with good cause, against the yellow and buff cards that are so much in vogue just now, and which, there is every reason to believe, have a good deal to do with the fading of photographs; but we do not think he made good his complaint against evil-smelling albumenized paper. Material of this kind may be suspicious, objectionable, and altogether untrustworthy, but we do not think chemists would pronounce bad odour to be evidence of its likelihood to yield unstable prints.

But, unfortunately, a thorough washing will not always give stable prints; as photographers know very well, albumenized prints fade every day upon which the greatest pains have been taken in the washing trough, while others that are known to have been scamped, or but hastily rinsed, retain their freshness and vigour for years. There is, in a word, something even more important than washing to be considered by photographers, if they hope to secure permanent silver prints. The fixing in many establishments is done without due care; it is relegated to a boy who has not been on the premises three months, or to a careless girl who objects to the dipping of her fingers continually in the soda solution. The hyposulphite gets exhausted, or the prints are not sufficiently separated in the fixing operation, and the consequence is, that the ingenuity and trustworthiness of the washing apparatus are all in vain. Many photographers have an idea that photographs printed in the winter are more permanent than those produced in summer, for the reason that the fixing is usually done by candlelight, and this brings to our mind a communication which was made to the Photographic Society, six or seven years ago, by Dr. E. J. Gayer, of the Indian army, and which has never had the attention it deserved. Dr. Gayer not only recommended the fixing of prints by candle-light, or in the dark, but further insisted on the employment of a very strong solution of hyposulphite. To his mind, as much as six ounces of hyposulphite of soda should be used in fixing a single sheet of albumenized paper. A print, say eight inches square, required for its perfect fixation one ounce of hyposulphite of soda dissolved in eight ounces of water. Dr. Gayer took his print into the dark room, immersed it in the fixing solution for ten minutes, and not until after it was rinsed in water did he bring it back into the light, to go through the usual operation of washing. He threw away the fixing solution after it had been used once, and fixed the next print in a fresh supply. Unless the process of fixation was carried out in this way, Dr. Gayer averred that an insoluble silver salt remained in the whites, which sooner or later must be acted upon by light, while prints treated in the manner he described were proof against an Indian sun for ten years at least, as he vouched by his own experience.

Although we can hardly expect photographers to follow Dr. Gayer's example in its entirety—the amount of hyposulphite prescribed is extraordinarily high—it is still beyond a doubt that many photographic chemists believe in the plan of fixing in the dark and employing strong hyposulphite solution. Mr. Spiller, who has given the subject of faded silver prints considerable attention, attributes the circumstance in a great measure to the formation of an insoluble compound in the whites of the picture, which may be termed an albuminate of silver. This compound once formed is not to be removed by any amount of washing, and it changes colour on being continually exposed to the action of light. We do not know if Mr. Spiller has found out whether albuminate of silver is formed when the fixing of the prints is conducted in the dark, but few photographers will deny that the employment of a very strong solution of hyposulphite is a measure to be recommended. Indeed, we may safely go further, and say that a good deal of fading is brought about by the carelessness of photographers in employing spent solutions, which but imperfectly dissolve out the chloride from their prints.

One other cause of fading, beyond that of the mounts, must be borne in mind, however, in discussing the stability of silver prints, and this cause is independent of the operations of fixing, washing, and mounting: we mean a vitiated atmosphere. In a coal and gas consuming country like this, the air of our towns and cities must always be more or less contaminated with sulphur. An ordinary sample of coal contains about one per cent. of sulphur, and coke, unless it is very good, contains the same. Therefore, for every hundred tons of coal or coke consumed in our cities, one ton of sulphur is given off into the air in the form of sulphurous acid, from whose attack few objects are safe. In our apartments, again, the gas burning in dining-room or library contains plenty of the destroying sulphur, and when we remember that the photograph is, after all, but a thin film of metallic silver, and silver is of all metals one of those most prone to suffer from the action of sulphurous acid, the picture must indeed be well protected if it is not to sustain injury.

Thus, to render the silver print permanent we have not only to eliminate all the hyposulphite by washing, and prevent the formation on the film of an insoluble compound sensitive to light, but we must also take care, when we have secured this end, to mask the image in such a way that fumes and vapours are without effect upon its surface. The mounting of photographs against glass is, perhaps, the most efficient protection, but varnish, collodion, and even a polish of wax, are valiant defenders of the silver photograph. Many, in framing photographs, place a card mount between print and glass, thus leaving a space into which vitiated air is not long in penetrating. Such a frame is no protection whatever. But defend silver prints as you may, it is the operations of fixing and washing upon which their permanence mostly depends; these should at least get as much attention from the photographer as he gives to the perfection of his negatives.

Notes.

There are fifty-two candidates this year for the blue riband of science—the Fellowship of the Royal Society.

Only fifteen Fellows are elected annually. Some years ago the Royal Society was a rather over-grown body, and to reduce its proportions a regulation was passed to limit the annual number of elections. Of late, the Fellows of the Society have gradually decreased, for the number of deaths for some time past has exceeded that of the newly-elected Fellows.

An exhibition of photographs and photographic apparatus will be held in St. Petersburgh in September. In another column we have given the regulations, translated from a Russian journal.

Another exhibition of an international character takes place the same month at Ghent. It is to be organized by the Belgian Photographic Association, and will be under the immediate patronage of the King.

The elections have been good for the photographers. Of one Conservative candidate we wot of, no less than five thousand portraits have been ordered, for distribution among the free and independent.

Mr. Marshal Wane, in his interesting paper on the washing of prints, read at Edinburgh the other day, touched upon the improbability of grease being readily removed from a butter tub. We think a solution of caustic soda or potash would do it without much difficulty.

We have purchased one of the luminous mirrors—a surface covered with the new luminous paint—and after permitting it to absorb sunlight, conveyed it into the dark room. With Dallmeyer's No. 1B lens and a gelatine plate we secured a well-defined image after an exposure of ten minutes.

At the last meeting of the Manchester Photographic Society Mr. Thomas Parkinson, of the Grammar School, Bolton, exhibited a swinging camera-front adapter, by means of which the direction of the lens could be altered to suit lofty objects. He has been good enough to favour us with working drawings of the adapter, to which we shall probably refer on a future occasion.

The Photographic Club, whose pleasant Wednesday evenings in Covent Garden are already famed, has issued its first list of members—upwards of sixty—and the Club rules, in the form of a tiny pamphlet. Only the first hundred members, it seems, are to be admitted without entrance fee, so the number of privileged candidates will be few in future. "Smoking is strictly enforced," we do not see among the rules, but we believe it to be one of them.

The Professor of Chemistry at Grenoble College has met with his death under very painful circumstances. In the middle of a lecture he drank off a glass of mercurial solution under the idea that it was *eau sucrée*, and expired almost immediately. A similar death through inadvertence happened at the Chemical Department at Woolwich some time ago. One of the laboratory attendants had in his cupboard a bottle of bitters, and another containing cyanide of potassium solution, which he employed for cleaning silver. Shortly before dinner one day, under the impression that he was swallowing bitters, he drank a glass of the cyanide. There was no help for the poor fellow, for he had taken the dose down at a gulp so as not to taste it, and as the stomach was empty, the poison acted at once. His mouth had set and he was unconscious within three minutes of the event.

Weather-science is attracting the attention of the German Government, and a request has been forwarded to the director of the *United States Signal Service* to know how it is possible that he can issue his "weather maps" within three hours of readings being taken at the various stations throughout the United States. The German government, in organising their Signal Service, is likely, it seems, to make the formation of the clouds a metereological study. It is not so long ago that Professor Piazzi Smyth, the Astronomer-Royal for Scotland, called attention to the importance of taking photographs of cloud changes, which he avowed would tell us as much about the weather as barometrical readings. One of these days, therefore, we may have our weather forecasts based upon photographs of the clouds.

The *Daily News* is rather hard upon English photography. A witness in the Divorce Court the other day was given a photograph and asked, "Is that the respondent?" upon which the reply was, "I've no doubt it's him, but it isn't like him." That is really, says our contemporary, what most people feel when they look at their friends' photographs, especially if the photographs be English. The features have a discoloured appearance, and the expression of the countenance is preternaturally sulky, but still it is the individual, "not Launcelot, nor another." Is our contemporary aware, we wonder, that the clearness in portraits, which it evidently admires in foreign pictures, is usually the result of the retouching pencil, and not the work of the camera at all?

M. Gustave de Vylder, to whose energy the foundation of the Photographic Association of Belgium is in a great measure due, was presented in the autumn of last year by his numerous friends and admirers with a very handsome group in bronze, from the atelier of the celebrated firm of Barbedienne, of Paris. M. de Vylder was the first president of the Association, and has always taken the leading part in editing the *Bulletin*—its official journal. The presentation was intended as a grateful recognition of the zeal and activity which, at considerable loss of time and money, he has continually manifested in furthering the objects of the Association.

Everybody knows how jealously the gates of the Royal Observatory are guarded, and what difficulties even scientific men have to gain admission. But Mr. Glaisher, the worthy President of the Photographic Society, and who was until lately Superintendent of the Meteorological Department, tells a story that goes far to prove that nothing is impossible to a resolute man. A vast star shower had been anticipated, and its coming heralded in every newspaper. The staff at Greenwich, with the Astronomer-Royal at their head, remained the whole night through making observations and counting the bright meteors as they fell. The weary night passed, and the small hours of the morning came, only to find the jaded observers still pursuing their duty. "That makes 10,704," said our friend Mr. Glaisher. "Beg pardon; how many?" exclaimed a voice behind him. "10,704," repeated the President of the Photographic Society; and then, not recognizing the voice, he turned and saw a stranger: "Who are you, and where do you come from?" At first, the only possible conjecture was, that the stranger had fallen from the clouds along with the star shower; but it was not so, for, closing a little note-book, he simply replied, "I am the special correspondent of the *New York Herald*. Thank you very much. Good morning." How that special managed to get through the park gates, and elude the vigilance of the keepers; how he got inside the walls of the Observatory; how he pressed into the sanctum of the Astronomer-Royal is a mystery to this day; but within a few hours of his interview with Mr. Glaisher the readers of the *New York Herald* printed a correct account of the marvellous star shower, together with many interesting details of the Observatory itself.

In the *Photographische Correspondenz* Dr. Schnauss gives a couple of formulæ for restoring the sensitiveness to gelatino-bromide plates which have been accidentally exposed to the light. The suspected plates are dipped in one of the following solutions:—

Ammonium bromide	8 parts
Water	192 ,,
Pure nitric acid	6 ,,

Or,

Carbonate of ammonia	20 ,,
Water	100 ,,
Caustic ammonia	a few drops.

After immersion, the plates may be exposed in the camera, and will give pictures quite free from fog.

Complaints are often made of the difficulty of getting the sensitive plate in the camera to occupy accurately the same position as the ground glass plate on which the focus was taken. When the instruments are new, everything may work smoothly; but in the course of a short time the wood work of the frames will warp and wear, and the two plates may be far from lying in the same plane. To obviate this, Herr Bühler has introduced an apparatus which ensures the sensitive plate occupying exactly the same position as that used when focussing. The invention is patented in Germany.

Topics of the Day.

UNHEALTHY DARK ROOMS.

BY GEORGE BRADFORDE.

Unhealthy dark rooms! Is not the title suggestive? Does it not carry with it the conviction—the stern reality—that in our dark rooms, along with our chemicals, we harbour Death?

"Dark rooms are necessary in the business!" cries the thoughtless worker. "If I have plenty of water, and no actinic rays, I care for nothing else." Foolish worker! He forgets that Health—health that is better than riches—is a necessary in the business likewise.

During the past winter, on a very sharp frosty day, I had occasion to call upon a brother photographer, and in the course of our conversation he complained of not feeling so well as he usually did—that, in fact, he feared he was getting old and used up, for he could assign no other reason to his weakness; he had pains in his legs, a choking in his throat, no appetite, and, at times, a singular giddiness in the head.

Our business led us to his dark room; when he opened the door, a cloud of hot air, pregnant with the fumes of the chemicals, rolled out upon us. It was stifling—overpowering! The little place was only about four feet broad by eight feet long. It had no ventilation—the window was a fixture, and to keep the chemicals in working order (such were my friend's words) he burned a couple of gas jets. The unhealthy heat of these jets, of course, ascended to the roof—a very low one, for I observed that my friend's head was within eighteen inches of it; I likewise observed that some water he had spilled upon the floor, while washing a negative, remained frozen. Thus he had his head hot, and his feet cool—quite the reverse of the rule of health—independent of the vile air that he breathed.

When I pointed this out as being the probable source of his illness—as I have no doubt it was—he exclaimed, "By Jove! You are right; I never thought of that." And how many are there like him! And how many dark rooms are there like his—that when the door is shut, the only inlet or outlet is the waste-pipe!

Next to ventilation, the waste-pipe is the thing of most consequence to health in the dark room. I remember, some years since, I went to manage a small business in the Fens in Lincolnshire. The dark room was pretty large for a small studio; it had a sliding window that acted nicely as a ventilator, and altogether looked a proper little place. However, while washing my first negatives I was amazed at seeing the water remain in the sink; this led me to feel for the mouth of the waste-pipe, which I found firmly plugged with a cork. I marvelled what that could mean, but in the course of the day I learnt the important part that the cork played in that dark room.

As the water from the Wash (part of the German Ocean that floods the Fens at every tide) rose over the mouth of the town sewer, it drove the sewage gas along the pipes, and unless the cork was used, filled the whole place with its nauseous effluvia. It was on my first day, after I had been at dinner, when I found my dark room seething with the poisonous air; I instantly called the governor's attention to it, and desired an explanation.

"Oh! I forgot to tell you," he exclaimed; "the cork is to keep the smell away during flood tides—cork it up tight, and you'll be as sweet as fresh butter"

"But, my dear sir, it must be very unhealthy!"

"My last assistant was here over three years, and he never complained," was his answer.

What could I say or do after this? I had only to follow my leader. Now here was a nice dark room poisoned through the lack of a little practical knowledge of our business. The man who laid the waste-pipe was under the impression that our chemicals were of a more

diabolical character than the sewage itself in way of smell, so he thought he was only doing a Christian act in joining it to the common sewer.

The governor knew nothing of the business, and believed the man implicitly. So much for employers who know nothing about the business! Now had they taken the simple plan of letting the waste-pipe run into the back yard, built a little gutter, sank a pipe at the end of the gutter, thus letting the whole run into the sewer clear from the dark room, the sewage gas would have dispersed in the back yard, and the dark room would have been free of taint.

There is another style of unhealthy dark room that is very common; viz., the little one. As a rule, I have not found them so little as one I wot of in Islington, for it always reminded me of a coffin stood on end, with a piece of yellow glass just about where the plate might be; I do not exaggerate, for the truth is, it was only a cupboard with the shelves taken out.

In Newcastle I once worked with a Mr. Russet—those who have read my papers entitled "Looking Back" may perchance remember him as being the type of a class that fancy they can do everything themselves. If you could not see Mr. Russet, you would be sure to hear him when he was in the house—he was sure to be sawing or hammering at something. His dark room was of his own construction, and it would have been as much as your situation was worth if you dared to disparage it. It was a poking little place with an entrance that I had to edge in at, and it was built *within* the studio: the window looked into the glass-room likewise, so that we had an opportunity of seeing how our sitters would look if they had the yellow jaundice.

"Handy little place!" he exclaimed, as he showed me over the shop. "I'm going to make a new door for it, then you'll be as snug as a bug in a rug!"

I said nothing, but I thought a good deal, especially about the snugness. The new door was put up at last, and I had to edge in more than ever. One day, when I was inside the misnamed box, Mr. Russet called me out, and in my hurry to attend him I forgot to come sidewise; the consequence was that I carried the sash and the door right into the middle of the glass-room on my shoulders. What Mr. Russet said is unfit to be printed.

Now, was the above a room (Heaven save the mark!) fit to work in? When I had to coat a plate there was only one way that I could stand if I wished to do it right; and then the ether from the collodion got into my eyes so that I had the appearance of weeping when I came forth to the sitter; then fix with cyanide. How about the fumes of the latter on an empty stomach? Did we not harbour death in the dark room there?

At present I work in a small room, but I hope to live to see the day when I shall work in one about twenty feet square with plenty of sliding windows and lots of ventilation—a place, you know, where one can find room in it to stow away the baths and bottles on the Saturday afternoon, so as to let the charwoman get at it with plenty of soap and water to make it smell fresh and wholesome on the Monday morning. That is my idea of a dark room.

Photographers should give a keen eye to this subject, and for their own and servants' sake see that the sanitary arrangements of their dark rooms are such that health—the foundation of all work, good or bad—is preserved.

The "Topic" for next week will be "Motive in Pictorial Photography," by Gilbert Fane.

ON CONVERTING OLD NEGATIVE BATH IN PRINTING BATH.

BY G. TANNAHILL.

I have a little to say on baths, which may be worthy of your notice, owing to a new era taking place in photography. There has been a great cry all along, "What shall I do with my old bath? What shall I do with a bad bath?" But the cry will be now, since the dry plates have taken root, "What shall I do with my good bath?"

In an old journal or almanac (I forget which) I saw that a perfect cure for a bad bath was to put salt in it. Well, I don't want you to do that, as it is too much trouble to refine it again, and it is astonishing how little refiners can take out of it for you. It seems to me when negative baths were introduced, a bad name was introduced with them. It is an old saying and a true one, "Give a dog a bad name, and it is sure to stick to him;" and certainly it has done so in this case. But in my opinion the bath is blamed for a great deal it is not guilty of, and for my part, I will say with confidence, the bath has been the best of friends to me. I always treated it like a gentleman, and I got the same off it. So if it is to die, let it die in peace, and peace be to its ashes. Or no! Cremate it, as I do. But in the first place I will say a few words as to how I make up and how I treat them, as it is probable they may be in use for a time yet, until we get a quicker developer for the dry plates, which I fully expect soon. It is all very well where the merits of the picture depend only on steadiness, such as cheap ones; but when it comes to a good price we must then study softness and vigour of light and shade, expression, steadiness and position, and see that they are all right before we allow the sitter to leave the studio, as generally at a high price it is credit, and the photographer is the loser; but in cheap or moderate work it is cash, and you can get them back again, so that is my argument for thinking we will have a few months of the bath yet, as it enables us to see at once the results.

Now as to making up negative bath. If of rain water, I catch it as fresh as I can filter it; if of tap water, I let it run for a good while before drawing; at night is the best time, because the water is always fresher in the pipes at night than in the morning; and if of hard water, I add a little bicarbonate of soda, and filter. Try some of it on your hands without soap, and if it is slippery, it is too soft; and if it catches, it is too hard. By trying rain water first you will soon know when it is right; then I proceed by taking, we will say, five ounces of silver, and dissolve it in as much water as will make it about sixty, adding one grain of iodide of potassium to each ounce of silver dissolved first in a little water, and when added to the silver shake well several times, then filter and it is ready for use. Do not add soda, then acid, and such like, to make it acid; it is only adding foreign matter that soon settles on the plate in some form or other. Well, as I say, your silver is ready for use, but it is sixty grains to the ounce. Well, take the half of it, and dilute to thirty, and it will work well immediately, keeping the other half as stock to add to the bath when it becomes weak, and that helps both bulk and strength, and saves you from requiring to make up baths every time you want to strengthen. Baths are often spoiled by introducing foreign matter, such as French chalk, rouge, spirits of wine, albumen, and other substrata.

I need not mention the numerous phenomena which have taken place with the bath when treated in this manner; it is like letting a child eat all it wants, then saying it has a weak stomach. I may say this—and it is, perhaps, a good deal—I will give for the negative bath when I throw it aside, *not* a sigh of relief, as some people will, but a sigh of grief at parting with an old and trustworthy friend; so as to using up the negative bath when we do take to dry plates, I will state briefly my experience, and show my result in a few prints.

Having a Winchester of old negative bath, I boiled it down in a reducing crucible until it commenced to cake on the sides like brown sugar; I withdrew the fire, and allowed it to cool and cake. I then dissolved it in a little water, and filtered it, adding more water to the filter, so as to wash it and lose no silver. I then added half-an-ounce of bicarbonate of soda, mixed in a little water, which, of course, made it effervesce smartly. I shook well, and

allowed it to settle; shook it up again, and filtered with the common filter-paper; added more water to the filter to leave no silver in it. I then had all my silver in the bottle and all my foreign matter in the filter-paper, which, when dried, I found to contain one-third more weight than the half-ounce of soda I added, which I attribute to peroxide of iron, iodide of potassium, and carbonate of lime, as the water is very hard in Dundee. Now the bath will be about 90° at this time, so you can make it to any strength you are in the habit of using. Of course, the stronger the bath the less time you keep the paper on the bath, but there are some very spongy papers in the market; do not use them, or if you do, don't blame the bath. I have done this several times now, and find it always works well and gives satisfactory results, never becoming discoloured, which is always the case when soda or an alkali is not used in the sensitizing bath. In making new silver into sensitizing bath, I always add soda, as it saves the silver to a great extent, and keeps the bath clear.

I may add a simple toning bath—

Chloride of gold	½ grain
Bicarbonate	6 grains
Tepid water	4 ounces

to one sheet of paper.

New every night. You don't save any gold by keeping a bath until it is that black you cannot see the prints an inch deep, because you have to add as much gold as would tone the prints with a new bath.

RAPID DRY PLATES.

BY H. W. BEVAN.

So much has been written and said about gelatine emulsion plates of late, I fear you must be almost tired of receiving communications on that subject; but knowing that it is only in its infancy, I venture to give a few practical details of the results which have proved most successful in my hands.

After three months' experimenting, the formula I am about to give is with me the most rapid, as the plates prepared are certainly much quicker than the commercial ones I have tried since last summer. I can obtain results at this time of the year which were impossible for me to get during the bright summer months with those plates.

Most of the commercial plates are called instantaneous, and, no doubt, working under some circumstances, instantaneous results may be secured, viz., out-door scenes, such as boating, cricketing, and movable objects, can be very well obtained; but can this be done in the studio? Of course, for such pictures, a drop shutter is essential.

I have the most rapid lenses and other appliances it is possible to get, and with the instantaneous plates, as advertised, I have not succeeded in getting anything like successful pictures of children, dogs, &c., whilst walking about the studio.

It is, I think, very desirable at times to take children in motion, for I find there are many such that will not be posed—these are usually called pets by their mammas. Many times ladies bring their children to my studio, and state that the only way they can be taken is while playing about. This has been my object in finding out the most rapid method of taking them. My formula for preparing the plates I will now briefly describe. For six ounces of emulsion take—

Ammonium bromide	40 grains
Fine cut gelatine	120 „

Place these in a vessel, and cover with 10 drms. of distilled water; now take 60 grains of silver, dissolve in 6 drms. of distilled water; place both liquids into warm water, so that they become both the same temperature (say), from 90° to 130° Fahr.; after standing a few minutes mix in the usual way; now add 30 minims of ammonia fort. (shake well after this), let it stand in water for about one hour, keeping it the same heat; take one-half of the emulsion, place it in a vessel that will stand heat, gradually raise the temperature until boiling; let it boil slowly for ten minutes, after this take it from the water, and let it cool down to about the same temperature as the other half left The whole of the emulsion can then be washed; after washing, place again into warm water, add 2 drms. of pure alcohol (if methylated spirits be used, 1 ounce); make up the six ounces with warm distilled water. The emulsion is now ready for use; if the liquid be very thin, or too transparent on pouring it on the plate, a little more gelatine may be added. I find no drawback from raising one-half of the emulsion to boiling heat. I think frilling will arise from various causes with all plates. These are not subject to frilling more than the commercial ones I have tried.

Many people say that it is essential to dry the plates quickly if you want them sensitive. For my part I have never found that it makes the slightest difference as to quickness whether they are dried spontaneously or artificially. I frequently coat and let them stand in a room at about 50° for five or six hours, and then finish drying close to some hot-water pipes, which would be about 90°, and on developing there is not the slightest difference in the parts dried by different heat; but if a plate is dried off in three or four hours, it is much more liable to frill than one that has been ten to twelve hours drying. A very good plan for drying is to have a small cupboard in the darkest part of the dark room with a little ventilation top and bottom. Plates will dry in such a closet in from twelve to twenty-four hours. The developer I use is as follows:—

Ammonia-bromide	30 grains
Strong liquid ammonia ...	1 drachm
Water	5 ounces
Pyrogallic acid	3 grains
Water	1 ounce

Add one ounce of the former to every ounce of the latter On developing, if the pictures come out very rapidly, the plate can be washed and finished with a developer containing a greater restrainer. If frilling sets in before the development is fully completed, a small quantity of methylated spirits, or two or three grains of chrome alum (which must be kept dissolved ready for use) may be added. This has been a sure remedy as far as my experience goes with the plates just described. If intensification is required, they will readily intensify by the formula kindly given by Mr. Edwards in your journal.

I enclose a few specimens which will give you a little idea of the very great sensitiveness of these plates. The child in the swing was taken while in full motion. A Dallmeyer No. 2C lens was used, and a guillotine drop shutter fitted inside the camera with an electric catch. This, I find, is very convenient, for I can stand quite close to my sitters, and yet be taking the portrait. I find that drop-shutter pictures can be obtained in the studio with some dry plates, but simply having a drop-shutter will not obtain perfect pictures while the sitters are in motion; but a diaphragm with a long slot cut across, the size made according to the quickness of the motion. This diaphragm must be placed in front or behind the shutter which falls. This, of course, decreases the exposure, and it is only under very favourable circumstances good results in the studio can be obtained. The picture of the little girl watering fern was taken on a dull day. This was exposed with a full open drop shutter. The portrait of lady was taken with a ten-inch focus lens, and with a shutter invented by Mr. Alexander Cowen, which will open and close as quickly as you can open and shut your hand.

LATERAL SPREAD OF THE IMAGE DURING ALKALINE DEVELOPMENT.

BY CAPTAIN ABNEY, R.E., F.R.S.*

n explanations which I have given at various times to the ociety, I have always insisted that in alkaline development e have a travelling outwards of the deposit from the nucleus hich forms the undeveloped image; and it may be in the ecollection of the Society that one of the proofs I gave of was the reception by a film, which had never been exposed, f an image from an exposed film beneath, the development roceeding both up and down, and also, as a consequence, n each side of the vertical to the plate. This last was not ery easy to demonstrate without the help of the microscope, ut I think the plate which I show will help to cause con-iction that I am right in my surmises. The small portion f the film which you see attached to the plate is a gelatine lm, taken from off a plate which had frilled in a most isagreeable way after leaving the fixing-bath. I detached his portion, and floated it on to a clean plate and allowed to dry, with no particular care, as you will perceive. I ow draw attention to the image. It was taken by contact the printing frame from a negative which is absolutely harp, at least it appears so when enlarged to four times the ze in the enlarging camera. The image looks absolutely ut of focus, blurred, and indistinct. On other plates, where he film has not frilled, the image appeared satisfactory; ut now that the image is four times the size that it was, his widening of points into discs becomes very apparent. t might also be traced with unequal tension of two sur-aces, that next the plate and the top surface, and the result ould be a drag of one part of the film to one side, and of e other to the other. This can hardly be the case, as the nage is blurred on all sides equally. I have thought it ight be worth while to call attention to this point, as we ave heard of some cases in which this expansion of gela-ne after frilling has been used to obtain a larger sized ortrait than that for which the sitter bargained. In the ase of portraiture this blurring may be an advantage, but r landscape work it certainly is not.

Correspondence.

SUBSTITUTE FOR SUBSTRATUM.

Dear Sir,—During the past few weeks I have had ccasion to work with wet emulsion plates.

The emulsion I use being advertised as requiring no ıbstratum, I took my traps and new emulsion, one fine ay last week, and went away to a wood in the vicinity, take some landscapes. I coated, exposed, and deve-ped a plate, and all went well till I applied the hyposul-hite solution, when the film immediately left every part of e plate, and floated on the small quantity of hyposulphite hich had got under it. I tried a second and third, but ith the same result.

Now, I had no substratum with me, and I did not feel clined to go so far home for it, so I tried the following, hich may not be a new discovery, but may be of use to me of your readers:—I took the plates, and ground them e-eighth of an inch on the face which was to hold e film—*i.e.*, one-eighth of an inch from the edge of the ate towards the centre—with a smooth sandstone and ater.

After doing this I had no more slipping, and could ash the plates in any fashion with impunity.—Yours uly, R. M. Malloch.

NEGLECTING TO RETURN SPECIMENS.

Dear Sir,—The practice of keeping specimens when a amped and directed envelope is enclosed for their return, lls for reproach from those not wishing to see the dignity and honour of our profession fall away. I should not ask you to insert my complaint in the Photographic News if such practice was confined to a few, but in my experience it is a custom that seems to be growing.

If this should meet the eye of wrong-doers, perhaps they may be given to repentance.—Yours, &c.,

An Assistant.

* Read before the Photographic Society of Great Britain.

Proceedings of Societies.

Glasgow Photographic Association.

A meeting of this Society was held in the Religious Institution Rooms, on Thursday evening, 11th inst., Mr. Urie in the chair.

The minutes of the previous meeting were read and approved of.

In answer to question in circular, "Is there to be a Social Meeting?" various proposals were advanced. It was finally arranged that it take the form of a supper at end of the session. A committee was formed composed of Messrs. Bell, Ramsay, and the Secretary, to make enquiries and report at next meeting.

The following gentlemen were duly elected members:—Messrs. Cutting and Dickie, amateurs, Glasgow.

In response to a notice in circular, pictures produced by gas-light were shown by Mr. Urie, some of them from negatives taken at a previous meeting. Some negatives made on gelatino-bromide plates, with prints from the same, were shown by Mr. Paton (Greenock) and Mr. Moran (Glasgow).

Questions asked about the various methods of production provoked an animated discussion. All the prints shown were presented to the Society. Messrs. Moran, Paton, and Dodd were awarded a vote of thanks for their kindness in giving the specimens shown. The Secretary was instructed to convey the thanks of the meeting to Mr. Urie, of Dundee, for his kindness in sending prints.

Mr. Swan exhibited a new form of actinometer for judging the exposure of camera work. It consisted of four strips of blue glass, one inch wide by five inches long, each overlapping the other about an inch.

The Chairman drew attention to an article that appeared in the *British Journal* anent the lapse of the carbon patent; and as his name, and the Glasgow Photographic Society, were called in question in the said article, he read a letter he proposed sending in answer to the insinuations it contained. The Secretary was also instructed to send a reply to the article in the journal.

A vote of thanks to the Chairman brought the meeting to a close.

Manchester Photographic Society.

The usual meeting of this Society took place at the Memoria Hall, Albert Square, on Thursday, March 11th, 1880, Mr. Alfred Brothers, F.R.A.S. (vice-president) in the chair.

The minutes of the previous meeting were read and passed.

Mr. John Schofield said that during the last few weeks he had been conducting some experiments with various kinds of gelatino dry plates, and in testing the rapidity of the same, he discovered the methods adopted, and exhibited a few negatives and prints.

Mr. Thomas Parkinson then exibited a very ingenious swing front for the camera, and a discussion took place as to merits of swing fronts and swing backs.

Mr. George Gregory then read a paper, the subject being "Practical Experience with Gelatine Dry Plates." This was followed by a discussion on the various methods of developing gelatine plates, and

Mr. John Warburton astonished the members by an account he gave of the exceedingly short time it took him to develop a gelatine dry plate.

Mr. Thomas Chilton then read a paper, the subject being "Notes on Gelatine Emulsion Process, &c.," and he demonstrated practically the working of the process, viz., the making of the emulsion, coating of plates, and also the development of the same. This was followed by a very interesting discussion, in which many of the members joined.

Messrs. Mawson and Swan had kindly sent for exhibition an exceedingly interesting collection of negatives taken on Swan's plates: one series illustrating the effects of strong and weak pyrogallic development, and another series showing the

effects of different exposures without compensation in the development with duplicates (exposed under the same conditions), but with the development modified to correct or compensate for the error of the under and over exposures; they also sent a collection of beautiful opal pictures, printed on Swan's opal plates. Both negatives and prints were the objects of universal interest and admiration, and with an unamious vote of thanks to Messrs. George Gregory and T. Chilton, and also to Messrs. Mawson and Swan, the proceedings terminated at a late hour.

Talk in the Studio.

Mr. H. Baden Pritchard's new novel, "George Vanbrugh's Mistake," will be published shortly by Messrs. Sampson Low, Marston, and Co.—*The Academy.*

South London Photographic Society.—The next meeting of this Society will take place on Thursday next, April 1st, at 8 p.m., in the rooms of the Society of Arts, Adelphi; when papers will be read by Mr. B. J. Edwards on "An Improved Alkaline Developer for Gelatine Plates," and by Mr. W. Brooks on "A Standard Method for Testing Rapid Dry Plates."

Russian Photographic Exhibition at St. Petersburgh.—The Russian Photographic Society forming the section of the Imperial Technical Society, opens an exhibition of photographic productions in the current year 1880, on September 20th, O.S. (this is twelve days behind our time). The object, according to the Russian organ of the exhibition, is to enlighten photographers upon the newest achievements of photographic technics. In order to attain more fully this object, photographers, both amateur and professional, as also manufacturers at home and abroad, are invited, who by their researches and labours have brought about the present development of the art, and who by the exhibition of their products will help to a correct estimate of the present state of it. There will be admitted to the exhibition every article having relation to photography under the following ten subdivisions; 1, chemicals; 2, apparatus, lenses, cameras, stands; 3, portraits and enlargements; 4, landscapes, and other reproductions from nature; 5, cartography (maps); 6, applications of photography to science; 7, photomechanical processes; 8, photographic appliances; 9, photographic accessories; 10, retouching. Anybody intending to become an exhibitor is requested to send for information as soon as possible, for the exhibition will not take place if the number of the exhibits is less than three hundred. One half of the expenses is covered by the funds of the Society, and the other half by prepayment of the wall space; 8 roubles for every square of 1½ archines by 3 archines (or ten shillings for about 2 yards square). The intending exhibitors are requested to remit the money for the space required, which will be returned if the number of exhibitors are not sufficient. Two copies of every photograph must be sent, one of which must be untouched, and the other as it is supplied to customers (this first for the jury). The objects exhibited can, according to the desire of the exhibitors, be sold, but on every article must be marked the price of it. Ten per cent. will be retained from the sale price for covering the Society's expenses.

To Correspondents.

G. L.—The milkiness just proves that your water is impure; use distilled water.

Grasp.—It is evidently under-exposed; there is no detail at all on the margin of the negative. We should recommend you to make a new bath; yours is evidently much too acid.

Crichton.—You cannot expect to get pure nitrate of silver on the first crystallization. You must redissolve the crystals in distilled water, and evaporate again. We do not recommend, however, any photographer converting his own silver into nitrate; the nitrous acid fumes given off on dissolving the silver in nitric acid are very poisonous.

J. Jordan.—1. See that your paper is properly dry before you place it in the printing frames; the ridges are evidently due to this. 2. The blurred portions show that the paper was not in contact with the negative; you must have a better pad in your frame, or more pressure. You will get on better after a little more practice.

Lux.—A French grey, pale lavender, or light blue are favourite washes for the interior of studios, especially the former. From your description, your studio is a fine one indeed.

Tyro.—Certainly you may, only we should not recommend you to do it. You might wire on your collodion film to prevent it slipping from the glass, and empty your pyrogallic developer into the silver bath to bring about a change, but neither plan is to be advised any more than those you describe. Good second-hand lenses are doubtless to be purchased, only take care. Meagher or Fallowfield will doubtless satisfy you in respect to the last point you mention.

S. E. Gordon.—What you send is pure silver, or, at any rate, there is no metallic gold in it; the whole dissolved without residue in nitric acid, and we recovered nitrate of silver crystals from the solution.

T. J.—Thank you for the hint; we hope to find him "at home" some day.

Syntax.—If you can have patience till the middle of next month, we shall be able to satisfy you.

Photo-Lithographer.—We can assure you that Mr. Butter's article is quite practical; he would, no doubt, show it you at work if you wrote to him. To be successful, however, you should be a good lithographer to begin with. You can hardly expect to turn out a good pair of top boots before you are well up in bluchers.

Abraham, Thomas Young, and Mercury.—Our "Note" seems to have attracted some attention. Dr. Siemens himself considered it not unlikely that the electric light might be used by nursery gardeners to bring forward flowers for market. If budding plants are submitted to the action of electric light for some hours after they have seen daylight, their blossoming will take place more rapidly. Indeed, Dr. Siemens makes his flowers "work overtime." He reckons that plants placed two metres from the electric lamp are receiving light equal to that of average daylight at this season of the year. Whether it would pay a nurseryman to have an electric light for blossoming flowers, is another thing. In a word, is the game worth the candle?

Victor.—The silver thrown down would not be chloride, but the pure metal. But the reason why copper or other metal plates are not more frequently used for precipitating from silver solutions is because the method is somewhat impracticable. By placing a strip of copper in the solution, as you describe, a deposit will be formed gradually, and on withdrawing the copper strip, the precipitate, which is pure silver, is easily removed. But as the solution becomes weaker and the copper strip more dirty, the deposit of silver gradually becomes very slow. On the other hand, the whole of the silver is at once thrown down in the form of chloride by adding either hydrochloric acid or common salt. And chloride is just as marketable an article as the precipitated silver before mentioned.

S. Perry.—We fear the expression *in unison* will not do; a chemist would at once take exception to it. If bath, collodion, and developer are all proved to be good, there should be nothing wanting to make good pictures in skilful hands. If a workman quarrelled with his tools under these circumstances, there could be but one inference. To suppose there can be a sort of sympathetic action between the three is ridiculous; all you can do is to be sure there is nothing wanting in any of them.

Sol.—Look in the Year-Book of 1874. Dr. Vogel's article, although relating to mounts, and not prints, gives a delicate test for hyposulphite. We shall shortly have a "Topic" on the subject, which you may be glad to see.

Douglas.—1. Gelatine plates are certainly suitable for amateurs, but their development may give you a little trouble at first. 2, 3, and 4. We would advise you to purchase Hughes' little handbook, "Principles and Practice," which will give you simple answers to all these questions; but if you want any specific advice we shall always be happy to give it; apply to Mr. Werge.

P. W. Long.—Thanks; we will forward.

Seabird.—If you will send your address we can furnish you with some information.

Gordon.—See Marshal Wane's paper in last week's News. He evidently alludes to the same washing machine. Send us a letter, and we will forward.

Several correspondents in our next.

PATENTS.

Compiled by Mr. Des Voeux,
Patent, Trade Marks, and Photographic Copyright Office, 32, Southampton Buildings, Chancery Lane, London.

No. 1216. William Robert Lake, of Southampton Buildings, London, "Improved Processes and Apparatus for the Production of Microscopic Photographs, chiefly Designed for Obtaining and Preserving Copies of Records, Pictures, Statuary, Natural Objects, and the like." A communication to him from abroad, by Eusebius J. Molera and John C. Cebrian, both of San Francisco, California, United States of America. Dated 20th March, 1880.

No. 1217. William Robert Lake, of Southampton Buildings, London. "Improved Apparatus for Facilitating the Reading or Examination of Microscopic Photographs of Written or Printed Documents, Pictures, Statuary, Natural Objects, or the like." A communication to him from abroad by Eusebius J. Molera and John C. Cebrian, both of San Francisco, California, United States of America. Dated 20th March, 1880.

The Photographic News, April 2, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photography and Medical Science — The Aspect and Temperature of Studios—Photography and the Elections—Photography and Prophecy.

Photography and Medical Science.—It is somewhat curious, considering the assistance which photography is capable of lending to medical science, that so little use is made of it in hospitals. Surely a record of abnormal cases would be worthy of preservation, to say nothing of the superiority, so far as accuracy is concerned, of the camera over the pencil of the artist, however skilful he may be. Photographs of the different forms of skin diseases, for instance, ought to be of great value not only to the specialist, but to the ordinary practitioner, and of still greater service would be a series illustrating the various stages of any cutaneous disorder, tracing it from an early appearance through its severity to the final point where health is restored. Of course there would be a difficulty in photographing a patient in an ordinary ward, but there is no reason why a small studio should not be attached to every hospital into which the bed (if the patient be not able to walk) could be wheeled. With gelatine plates the manipulatory details are reduced to a minimum, but if our medical friends do not care to dabble in the art themselves, assistants abound, and there are hosts who would not object to be engaged at a hospital for a permanency.

The Aspect and Temperature of Studios.—Has any one ever taken note of the difference in the temperature of studios having a south aspect compared with those facing east and west? Naturally, one would say, the studio which has the greatest amount of sunlight upon it would be the hottest; but if the experiments of a German chemist, Dr. Adolph Vogt, be well founded, this is by no means so certain. Dr. Vogt, it would appear, had his doubts on the subject, so far as houses are concerned, and in a recent number of the *Zeitschrift für Biologie*, detailed the experiments he made to determine the point. He took three square plates of sandstone fifty-one centimetres in length and fourteen millimetres in thickness, and attached to each plate a zinc vessel containing water, and of the same size as the sandstone. A thermometer was placed in the water, and the vessel was enclosed in a case of wood and packed with hair, by which means all the heat communicated to the water could only reach it through the plate in front. These plates were then placed in an open space, one towards the east, one to the west, and one to the south. Owing to the bad weather of last year, uninterrupted hourly observations were very difficult to obtain; but on two days—July 25th and 29th—these were accomplished, and with a result which must certainly be called unexpected. The readings of the thermometers unmistakably showed that the stone facing the south, though it was twice as long exposed to the sun's rays as the other two, and although it had the benefit of the midday sun, yet absorbed the least amount of heat. The actual proportions were—on July 25th, east 100°, west 75°, and south 68°; and on July 29th, east 100°, west 88°, and south 86°. The temperature of the water in the eastern water-vessel, on July 25th, reached its maximum, 33·4° C., at eleven o'clock a.m.; in the southern vessel, 36·2° C. at three p.m.; and in the western, 40·38 at six p.m. On the 29th the temperatures were respectively, at the hours just mentioned, 34·8°, 37·4°, and 44°. On the last-mentioned date the highest air temperature happened to be at three p.m., and this no doubt accounts for the reading being higher in the south on that day than on the 25th. The figures are very curious, and, if verified, should furnish some useful hints in the choice of a house. So far as studios are concerned, as light and not heat is what is wanted, the matter is not of such importance. It may be as well to remember, however, when the warm weather comes, that nothing is so efficacious in reducing the temperature of a studio as calico screens thoroughly saturated with water. A couple of these made of calico stretched on light wooden frames about six feet by three, well drenched, will speedily give a refreshing coolness.

Photography and the Election.—The distribution of the photographs of candidates for Parliamentary honours mentioned last week is not the only mode in which photography has been called in requisition for electioneering purposes. In one of the metropolitan boroughs a sensation during the past week has been made by the exhibition by a local photographer of the portrait of the candidates by the aid of the magic lantern. The means used were rather primitive. On the top of his show-cases, in his front garden, he placed a wooden frame, about six feet square, on which the sheet was stretched. The lantern was stationed in the first-floor window, and concealed from view by canvas sides reaching from the frame to the house. The portrait came out with pretty fair effect, though, whenever the wind blew the sheet about, the amiable candidate's features were by no means improved.

Photography and Prophecy.—People generally may not be aware that the world is coming to an end in the year eighteen hundred and eighty-one. Whether this date has been determined by the exigencies of rhyme, as contained in the famous prophecy of Mother Shipton, we are unable to decide; but certain it is that some authorities fix the period a year later, and, as an author who has recently written on the subject, in a little volume entitled "The End of the World," puts it—

> "Should that fated year not do,
> Try eighteen hundred and eighty-two."

Some may ask, what has the end of the world to do with photographers? Well, not much; saving and excepting that they, with other units, may be supposed to feel some curiosity concerning the fate of the globe. But upon what some consider a kindred subject—the termination of the temporal power of the Pope—they ought to have a deep and absorbing interest, for it appears that the ninth Pope in succession after the present one—there are to be but eleven more of them altogether—has for his motto, "The Photographer." The prophecies relating to the popes are attributed to Archbishop Malachi, of Armagh, who lived in the twelfth century, and to each pope of the nineteenth century he has given a character in the shape of one of these mottoes. Thus Pius VII. is described as "A Rapacious Eagle"; Leo XII. "A Dog and a Serpent"; Pius IX. "Cross upon Cross"; and Leo XIII. "Light from Heaven." Proceeding to peer into the future beyond Leo XIII., the Archbishop prescribes in a similar way for the other popes, and assigns to No. 9 the words, "De labore solis," which has been freely rendered as "The Photographer." Naturally, all the members of the photographic profession will be delighted to hear of the high honour in prospect for them. To have a patron saint in a pope—though it may be two or three hundred years before this consummation is arrived at—is more than the most ardent knight of the camera who ever blackened his fingers could expect. We must confess that at present we do not quite see the connection between a Pope of Rome and the photographer, and any one who wishes to know more of the subject we beg to refer to the author we have already mentioned.

INTERNATIONAL EXHIBITION OF PHOTOGRAPHY AT GHENT.

On the occasion of the Jubilee Festival, commemorative of the Declaration of Belgian Independence, an International Exhibition of Photographs and Photographic Appliances will be held at Ghent. All the various branches of the photographic art and its applications will be represented. The exhibition is to be held in the buildings of the University; it will be opened on the 1st September next, and remain open until the 25th of the same month. Any one wishing to become an exhibitor should

signify his intention to M. E. Varenbergh, secretary of the *Chambre Syndicate des Arts Industriels* at the *Hotel du Gouvernement, Gand*, as soon as possible, and in any case before the 20th July. He will be required to fill up a form (to be had on application at the above address), giving the particulars of his exhibit, and the amount of space he will require.

We give below a short abstract of the regulations laid down by the committee of management:—All the objects to be exhibited must be sent, carriage paid, to M. Varenbergh, at the *Palais de l'Université, Gand*, before the 20th August; this date will be strictly adhered to as the last day on which goods can be received. All photographs should be framed, but, to avoid expense and risk of carriage, the framing may be done by agents of exhibitors on the spot; or, if they prefer it, exhibitors may forward their pictures unframed to M. Varenbergh, who will undertake—provided he receives them before the 1st August—to have them framed and glazed with care and economy. In this case the parcel must be accompanied by a post-office order to defray the expense, and if the amount of the order exceeds the cost, the overplus will be afterwards returned to the exhibitor.

No object to be exhibited may have the price at which it can be sold marked on it, but a register of prices open to the public will be kept by the secretary of the exhibition. Exhibits may not be removed from the exhibition before the closing, even though it should be decided to keep it open longer than at first intended.

All objects intended for exhibition will first be submitted to a jury of selection, who will decide on their admission or rejection. Exhibitors are advised to facilitate the labour of the jury by themselves carefully choosing only the best specimens of their art, and by refusing to send instruments and appliances which offer but little interest or novelty. The jury of selection will exclude all objects of inferior character, such as are inconvenient of exhibition, and those which possess no merit or utility.

A second jury will afterwards be appointed for the award of prizes in money and silver-gilt, silver, and bronze medals as well as certificates of honourable mention. These awards are offered as follows:—1, for the best specimen of heliographic engraving—three prizes; 2, for the largest and finest print by phototypie in fatty inks—three prizes; 3, for the finest specimen of printing by the Woodburytype or any analogous process—three prizes; 4, for the most beautiful and numerous collection of carbon prints, either direct or enlarged—two prizes; 5, for enamelled photographs possessing special value as an industrial application (for example, for the ornamentation of furniture and glass ware)—two prizes; 6, for cyanotypes or similar reproductions of drawings and plans by the action of light—two prizes; for photography with the salts of silver, on albumenized paper, or other support (the largest and best collection of pictures of this kind distinguished for originality, elegance, and absence of retouching)—one prize; lastly, three prizes for photographic instruments and apparatus specially remarkable for elegance, serviceableness, and convenience. Further, a prize for distinguished excellence may be awarded to the exhibitor whose whole exhibit is distinguished by exceptional merit, in whatever class his works may be included.

A lottery will be held at the close of the exhibition, in which the lots will be selected from the objects exhibited, and will be purchased by the managing committee. To defray expenses, 10 per cent. of the price of all objects sold will be deducted for the benefit of the executive. The committee of management will bear all the expenses of organisation, packing, and unpacking; exhibitors will only have to pay the cost of carriage to and from the exhibition.

Full information on all the above points, and on all other details of the exhibition, may be obtained on application to the secretary, M. Varenbergh, *Hotel du Gouvernement, Gand.*

At Home.

THE CRIMINAL INVESTIGATION DEPARTMENT AT SCOTLAND YARD.

If you turn sharp to the left past the public-house at the corner, when you enter Scotland Yard, there is before you a door marked "Convict Office." This door is difficult to pass, at least we found it so. It was as if the policemen inside, who act as clerks, were sustaining a siege, and had fortified themselves accordingly. The inner door was locked, and the inquiry window bolted. We could see men in dark uniforms and silver buttons busily writing in huge books, or with quill pens in their mouths ruling lengthy columns, and there was a silent-system atmosphere and metallic-handcuff-look about the place that was rather oppressive. Under these circumstances we should have thought the "Convict Office" scarcely likely to be troubled by doubtful visitors, and that there would be little necessity for staving off casuals; but perhaps policemen are nervous men after all, and, notwithstanding the severe cut of their clothes, have very soft hearts underneath.

"Is that your *own* card, sir," sharply asked one of the janitors, working a sort of drawbridge arrangement to open the window; they are too cunning to let you inside. A mild intimation that it was, and that we were, moreover, the bearer of a note of introduction to one of the chiefs, did not mollify the unbelieving functionary. He looked at the card, and he looked at the inscription on the note, and then, in answer to a confident smile on our part, said, "Well, he isn't in." It was obviously our turn to speak now, so adopting a more serious vein we briefly remarked, "Oh!" This seemed to strike the policeman rather forcibly, for giving a sidelong glance again in our direction, he said he would go and see if he could find his chief.

The man was as good as his word. He went off, and he did find the officer; and, what is more, the latter proved far less suspicious than his minion, for in two minutes the door was unlocked with a latch key, and we were inside "The Criminal Investigation Department," face to face with a fierce-looking, but evidently good-natured gentleman.

At Scotland Yard is to be found the only complete collection of criminal photographic portraits in the United Kingdom. When we say that there are no less than thirty volumes, and each volume contains five hundred portraits, our readers will at once understand the magnitude of the photographic library. Fifteen thousand ladies and gentlemen are here depicted, all of whom have sojourned for some time in Her Majesty's jails. The photographs are taken, as a rule, one month before the prisoner is liberated after his spell of "penal," and as the man is permitted to let his beard and hair grow within three months of his release, it is not astonishing to find that most of the men have short stubbly hair on their faces. At first sight, one is apt to remark upon this unfavourable aspect of the men, which seems to stamp them as of low origin, just in the same way as convicts at work are stigmatised as bullet-headed; but if you shave a man close and crop his hair, it is surely only natural that he is bullet-headed, and if a man's beard has had but two months to grow, it is very likely to be stubbly.

Taking into consideration, then, the unfavourable state of the models and the absence of all retouching and dodging in the negatives, which is, of course, strictly prohibited, the series before us may be pronounced very passable work. It has been done in the various prisons under supervision of the respective governors, who have care of all negatives. Prints only are sent to Scotland Yard. There is no photographic laboratory or staff of photographers attached to the police, as in Paris, in the Rue de Jerusalem, which is under the supervision of two special "inspector-photographers." "And I am very glad there is not," says our host, "for then they would be for carrying

matters too far. I have in my office a horrible picture sent me by the Paris police of a body that was cut into pieces by the murderer." In some jails, prisoners do their own photography, in others it is done by one of the warders or by an outsider, and, unfortunately, each governor has usually his own views on the subject, so that the pictures, although of the same dimensions—three-quarter carte—are not taken from the same aspect, &c.

Here is a volume showing "Classification of Crime." The portraits are arranged according to the crimes committed by the sitters:—

Arson.
Bigamy, abduction, &c.
Burglary.
Forgery, embezzlement, &c.
Manslaughter.
&c., &c.

"Now, can you," we asked, as we turned the leaves of this interesting album, "make out any connection between the physiognomy of the criminals and the nature of their crime?" The question was rather ridiculous, it occurred to us immediately afterwards, because it would be a little absurd to connect arson, for instance, with a snub nose, and burglary with large ears. There was no hesitation about the reply we received. In our host's experience the criminal class began with small crimes and ended with big ones; crime, like other sciences, was progressive. "Now, here is a man," pointing to a smiling portrait of the better class, "who has probably committed every crime under the sun; to my knowledge he has had four 'penals,' and may be said to pass his life in prison." Another man was picked out—a young fellow this time—with a fair, soft beard and incipient moustache, who, with a little brushing up, would look like a *jeune premier* of the French stage. His portrait is marked "dangerous," and he is under the denomination of burglary. "What is he dangerous at—breaking in?" we asked. "Breaking-out," was the curt reply; "it's the same crime; he conceals himself in the daytime and breaks out at night." Another grizzled face is also marked "dangerous"; there are copious notes about him, but at the end of all stands the word "dead"; he, poor fellow, will never more be worried by the bull-dogs of the law.

"All the portraits should be taken half-profile," says our informant; "there is no character in a full face, but we cannot get the governors always to do as we wish." This, it seems, is the general opinion among the warders and inspectors who are occupied in the identification of criminals, and this will, in future, be the aspect chosen for all prisoners. The shape of the nose and the nature of the cheek-bone is then very apparent, as are also the general characteristics of the face; while, it must be remembered, that in looking at a man you generally study him sideways, for obvious reasons. In the full face and true profile, you lose much character, which is shown in a portrait taken between the two. Photographers, we believe, will generally agree with the criminal officers in this, and, indeed, as we know, they execute the majority of portraits under like conditions; it is only the governors of prisons, indeed, who seem fraught with the one idea that the more you see of a face the more likely you are to recognise it again, and hence have a firm belief in full-face portraits; gradually, however, a change is coming over their work, and this change will, no doubt, be hastened by some distinct regulations as to the mode of taking criminal portraits, to be issued from the Home Office. Probably, governors think they have quite enough to do keeping watch and ward over their prisoners, without bothering about photography.

Here is a simple and effective application of criminal photography. It is a printed form, with written words filled in at intervals. At one of the bottom corners is a neatly-mounted carte portrait of a man. He is an elderly prisoner, just released, with a hooked nose, sharp eyes, and white stubble about the jaws, for all the world like a caged vulture whose feathers have been worn against the bars. He has been released on "ticket-of-leave," and has given notice to the police (as he must) that in future he will reside in Gloucester. Accordingly, he is ordered to report himself at stated times to the Gloucester police, and the printed form before us conveys the necessary information for the man's identification, and will be forwarded to that town. There is a note above the portrait, "shaved since released"; but the hooked nose and the sharp eyes remain for all that, and these will be quite enough for the police.

These photographic albums are often consulted, and form the best histories of criminals. A man is in custody, and warders come from all parts to identify him; they could swear, possibly, to his having suffered penal servitude, but they can make nothing of him. Presently one warder believes he has seen the face before; he studies the man's features again and again, and finally hies away to Scotland Yard to study the albums also. "Here he is—that's the man; I thought I knew him; John Jones, convicted of burglary at Maidstone in '74," and this is at once corroborated by the local police, who are sent for to verify the warder's dictum. The description of the man on the police books, his height, and, perhaps, a mark on hand or leg, are then quite enough to convert doubt into certainty.

It is the opinion of professional recognisers that if the sitter slopes his face to the right, the portrait is more easily known than sloping to the left, a hint that photographers may like to have; although, as a rule, they choose according to the more favourable side of the face. It is an undeniable fact, however, that the human nose is rarely straight, and its direction generally depends upon which side you rest when sleeping. At any rate, the thief-catcher prefers always to have a portrait taken in the way we have mentioned.

An impression of a very forcible nature rests upon the mind as you leave Scotland Yard behind you, which is, that photography has probably done much more than any other of the recent police improvements towards the detection and suppression of crime.

The next "At Home" will be "Mr. William England, St. James' Square, Notting Hill."

NOTES ON THE GELATINE EMULSION PROCESS, WITH A PRACTICAL DEMONSTRATION OF THE PREPARATION OF THE EMULSION, COATING OF PLATES, &c.

BY THOMAS CHILTON.*

At various times we have heard of or seen and appreciated some of the wonderful results obtained through the changes that have taken place during the last two years in the preparation and working of gelatine plates. For these results our thanks are due to the many workers who have from time to time given particulars of their modes of working and the experience gained therefrom, foremost among whom must be mentioned the name of Mr. C. Bennett, who has brought about the most important change, namely, "the extreme sensitiveness obtained by the application of heat to the emulsion, and the use of a very strong developer therewith." You will doubtless know how this method of working has gained ground, and how it promises to effect one of the greatest revolutions known to photography. And we all must agree that the thanks of photographers are due (and, I doubt not, are often silently expressed) to Mr. Bennett for the very generous manner in which he made public his improved method.

Seeing that we have such a valuable means at our disposal, the question arises—Are photographers who entirely ignore this process acting to their own best interests? Should they

* A communication to the Manchester Photographic Society.

rather not make themselves acquainted with the working of the power that is about them? and if the number of dry plate makers be any criterion there are just grounds for believing that, slowly but surely, the new power is being appreciated.

Knowing that increasing interest is being taken in the process, and, moreover, considering that we, as a Society, have given comparatively little attention to it, I am persuaded that a practical demonstration of the preparation of the emulsion and plates will not be unprofitable and, I trust, not without its effect. For this reason I gladly availed myself of the opportunity given me by our energetic Secretary (Mr. W. J. Chadwick) to bring the subject before you.

Before turning to the practical part of our meeting I wish to make observations which I hope will prove helpful to other workers. Many of you will remember that when I appeared before the Society on behalf of the gelatine process, in December, 1877, I complained of the trouble I had experienced owing to the frilling of the film—a defect very few have the pleasure of escaping. It affords me much pleasure to be able to lay before you what I believe to be a cure for frilling. I am aware the general opinion is that a gelatine film does not require a substratum—an opinion which I re-echoed on the occasion just referred to. Since then I have satisfied myself that a plate to which has been applied a substratum previous to coating with emulsion will (if not in all cases, certainly with few exceptions) give a result free from frilling. I do not say any substratum will do. I am doubtful about albumen, which appears to be loosened by the strong developer used. India-rubber in benzole will answer, but there is a difficulty in getting an even film with the emulsion. The one I have used with success for nearly twelve months is a solution of gelatine with an addition of chrome alum, as suggested for collodion emulsions by Mr. H. Cooper, from whom I quote :—"The formula is gelatine sixty grains, water ten ounces. When dissolved add two and a half grains of chrome alum dissolved in a little water; stir well and filter, and keep warm. Coat the plates whilst wet after cleaning, and rear up to dry. To coat a dozen plates takes far less time than to wipe and polish them." If required, spoilt films may be removed with the aid of a brush after soaking them in water to which has been added a little common salt, as recommended by Mr. Edwards. *(To be continued.)*

PRINCIPLES OR RULES OF PICTORIAL COMPOSITION.

At the last meeting of the Edinburgh Photographic Society, Mr. W. Neilson read a careful and succinct paper on this subject; the several points touched upon he placed under distinct headings, so as to treat of them specially in turn. They were as follows:—

Unity.—This word embosoms one of the grandest ideas concerning nature—the uniting of its myriad details in a oneness; one end alone in view. The world is a unity. The universe is a unity. And as it is in nature so it is in art, which is the artificial representation or translation of nature. A picture must be pervaded with a oneness of design, and the wider the design is, giving, in its unity, play for the rules of art, the more complete will the picture be as a work of art. The generality of pictures now seem to be of narrow design—mere sections of landscapes, giving no great range for the rules of art; but if they are to be esteemed pictures at all, they must at least be a unity. Details are only admirable in art in proportion as they conduce to help out the design. Bricks are not very admirable in themselves, but they become noble as parts of a sublime temple. The photographer is at a disadvantage as regards this rule. He cannot command the sections of nature before him into unity; but he may arrange so as to bring into prominence the parts that conduce to the main design, and throw into shade the parts that would interfere with that.

Likeness in Unlikeness.—This I call the fundamental law of all the fine arts. It meets a want of our nature. So much is it in accordance with our human constitution that a child's first approach to intellectual delight is when the words of a man are put into the mouth of a bear, or the like. And what book of enchantments ever can equal that first delicious classic, "Who Killed Cock Robin"? Allegory, fable, and simile derive their fascination from "likeness in unlikeness." It underlies the whole of music, although sometimes so slightly interwoven that it can scarcely be observed; but it becomes fully apparent in "variations" and "fugues." It also underlies the rhythm of poetry, although it may be very delicately modulated; and the charm of rhyme depends wholly on it—two different words meeting in one sound. Architecture is greatly indebted to it, and sculpture and pictorial art could not exist without it. In sculpture it gives the rounded figure without the colour of life, and in the picture it gives the colour of nature on a flat surface; but it also enters, more or less, into the constitution of the picture. A mere cohesion of parts cannot constitute a picture such as fine art demands. The picture must be pervaded with a unity of character; and this can only be effected by the parts having some constructive relation to each other—something of the nature of what we call a "family likeness." For instance: if there be one shape of curve in one direction, there must be another shape of curve in another direction; or if there be a wedge-shaped hill in one direction, there must be a wedge-shape of hill, wood, or water in some other direction, and so on. In short, the chief features must, more or less, in some way be repeated in other features, which are yet different, just as the leading idea in music is reflected in varied modifications as the theme progresses.

This likeness in unlikeness may be strongly pronounced or merely indicated, but it is essential to completeness, especially in pictures of wide design. Even in colour there is trace of this rule, however veiled in the interblending of its tints and tones. Let a slant of sunshine fall on a rumpled piece of crimson velvet, and in the variety of its splendour you will find also the charm of likeness in unlikeness. In fact, this rule pervades alike philosophy, science, and art—being founded on that faculty which reasons by analogy—which compares resemblances and differences, and so recognises what feature of unity exists throughout the wide kingdom of diversified objects. "The child is father of the man;" and what the one experiences in the tragedy of "Cock Robin" the other experiences in all that makes up the drama of life—the delight of finding in different things somewhat of the attribute of one in the individuality of another.

Variety.—This rule has especial exhibition in music. Monotony in certain cases, such as in vast extent of blue sky, boundless calmness of sea, or loneliness of desert is sublime, and it is effective when introduced by the rare hand of a master in a limited manner in music. But the characteristic of music is variety in all grades of high and low, fast and slow, loud and subdued. By this perpetually-complicated variety music has in some respects a greater command of our emotional being than the other fine arts have. Poetry and painting, by their mediums of idea and incident, attract the mind somewhat to the suggestive; but tone, and medium of music, does not interrupt the mind in being wholly receptive. Responding to the variety of complicated cadences, our being is carried into the universe of emotion. In like manner variety is effective in a picture, though in a much more limited way. Music passes us like a panorama—now one thing and then another; but the picture is stationary, and must keep strictly before us its dominant characteristic. Consistent with this, the more variety it introduces the more will the picture gain in emotive power; but variety should be employed only as subsidiary to the general effect. Undue variety is the destruction of a picture.

Contrast.—The power of contrast is, of course, in proportion as the two opposites brought in contact are more or less extreme. After the lull that precedes a storm the sudden crash of thunder is sublime. In a much more modified degree, a grand effect is produced when a subdued strain is followed

by the loud strength of a full orchestra. But the power of contrast has two meanings according as it is used; and whilst in the hands of a Beethoven it results in grandeur, there are other hands which make it result in mere vulgar noise. In like manner it may be used or abused in a picture. A great power may work in a wrong direction. Pictorial contrast should be employed only to heighten the effect of the object to which it comes in opposition. A strong contrast, as in the transverse rift in a mountain, may conduce to grandeur, and a deep shade below a sunny tree may conduce to calmness of effect; but, as a general rule, contrasts should be of a subdued character. But all must depend on the nature of the scene. When the contrasts are too feeble for the subject, the picture will be weak; and when they are too strong the picture will be defective in harmony. It is safe to have the foreground in more or less decided contrast—in shape, shade, or bulk—to the main body of the picture.

Lines and Curves.—These two are antagonistic to each other, though, like man and wife, they may work together with the happiest effect. The masculine line, so to speak, in conjunction with the feminine curve, may produce compound emotion in the mind, with that peculiar charm which arises from two opposing qualities being reconciled. The line tends to give strength, the curve to give grace. Where a moral or a truth is to be enforced it may be of advantage to have line upon line: but in a picture such a process will seldom conduce to pleasurable emotion. The leading lines of a picture should flow, more or less, in different directions, yet so as to be in harmony with each other. A long, straight line in any direction is inadmissible; the pleasant undulation of the snake, however, might be copied to some extent. Short, straight lines are sometimes most effective in giving the impression of strength. No picture can be worth looking at unless it contains a due allowance of shapes more or less curved, upwards, or downwards, as required; now it may be on the shoulder of a hill, and again in the droop of a tree. The curve gives grace, and so tends to fascination. It is the woman of the world of art. However, it must be sparingly introduced, or its effect will be weakened.

Light and Shade.—These two opposites are the great powers which dominate the world of art, and in proportion to their importance is the difficulty of arranging them. The photographer who aims high should study the view he selects at different hours, so as to make sure of the most befitting arrangements of lights and shades in regard to the character of the scene. He must never forget that the success of his picture depends mainly on the mood of his colleague—the sun. Lights and shades are to the picture what loud and low passages are to music. But whilst music may indulge its varieties throughout the whole piece, it is different with the stationary picture. Lights and shades must not be scattered throughout it. Patchiness is the curse of a picture. It is desirable to have one dominant light near the centre of the picture, if possible, that will bring the chief feature into prominence, which may be enhanced by having, more or less, around it a scantling of shade. On either side of the chief feature it is desirable to have an extent of secondary lights and also of secondary shades, which will give the feeling of breadth to the picture, the lights having in some measure broken up with shade effects here and there, and the shades with lights. A mass of shade has a fine effect when an object—a rock, for instance—is seen dimly rising out of it, giving that mysterious feeling which is an element of grandeur. An object—such as a mountain—may be heightened by having its base mantled with shades, which graduate downwards with increasing depth. A strong light and a strong shade set side by side produce a wonderful effect; but care must be taken that it does not become too "loud" for the harmony of the picture. A fine contrast may result from a dash of transverse shade. As photographs are apt to be too abundant in details that will push themselves forward, it may be well to subdue them with what shading effects are possible.

Distance.—This adds the crowning charm to a scene. Campbell did well to begin his poem about *Hope* with a bit of truth—

"'Tis distance lends enchantment to the view."

Different widths of light, slightly tempered with shade effects, mellowing away in gradation till at last they reach a streak of light or are lost in a softened haze, have a magical effect on a scene. But this seems to be the despair of art. The lens, with its unfortunate habit, makes the distance as sharp as the foreground, and artists for the most part seem to have sworn to forego the attempt. It required the genius of Turner to solve the difficulty. The most hopeful way of giving a feeling of distance is to have a strong contrasting foreground, showing some capability of ruggedness.

The Indirect.—This rule has to do with introducing what is not necessarily a part of the picture, but yet tends to intensify its effect. It abounds in all high poetry. In landscapes it is confined nearly wholly to the introduction of figures. For instance: in a rural scene a cow may add to the sentiment of the picture, or a bird with wide-floating wings may help the feeling of a calm sky; but figures as often spoil pictures as improve them. Photographers should lay this to heart.

Repose.—Repose is the highest attitude of beauty and grandeur. Hercules is grand fighting with the lion, but grander is his calm majesty at rest on his club. Keats states it as "Strength reclining on his own right arm." Bustling pictures full of windy effects or wide-running water may show the skill of the artist, but, besides being bankrupt of repose, they are founded on the mistake of trying to represent motion in a stationary position. Such pictures may appeal to the imagination, but they are failures as works of art, inasmuch as they cannot excite the emotion which the scene they represent would. Does the picture of a flash of lightning make you feel as the lightning would? A bit of running water may be allowed as a contrast to the repose of a scene, like the effect of a whisper in a vast silence; but a bit of quiet lake would probably be better, if artists would study the general character of water, and see how the interplay of light and colour sinks into its translucency. To call a splatch of glare in a photograph water is not commendable. Simplicity is essential to repose. A crowded picture is antagonistic to it. Entanglement of lines must be avoided. The main effect, draped, as it were, with no more details than are necessary to set it off, is what is wanted. Birds or figures are apt to destroy the effect, though one bird or figure, not prominently introduced, may help to intensify it.

Harmony.—Harmony is the perfection of order; hence we have the phrase, "The music of the spheres," denoting the order of their movements, which admits of mechanical measurement. Earthly music can also have its harmony measured mechanically. But the artist's eye is the sole measure of a picture; it must judge how that element of harmony, a fitting balance, is maintained, so that no part may give the feeling of being overloaded. Anything suggestive of mechanical measurement has a discordant effect, and hence it is inadmissible to divide the canvas equally—one half land and one half sky; for the land half would seem to overbalance the sky half, besides being somewhat suggestive of what belongs to rule and compasses. In a word: harmony is the master rule which arranges and controls all the others, so that the whole becomes united in a well-ordered unity. It i the completion of art—the artist's highest reach.

It is evident the photographer can only have partial command of these rules; but whether his aim is to cover a wide design, requiring much consideration, or merely to take random views on a holiday, he will find that a thorough knowledge of the requirements of art will enable him to obtain more satisfactory results—not that he will consciously apply the rules, but that, having thoroughly digested them, they will work in him like an instinct.

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THE EFFECT OF TEMPERATURE IN FORMING A GELATINE EMULSION.

The best temperature and length of time to form an emulsion of bromide of silver in gelatine are points about which there is some dispute, and yet decidedly they ought not to be left in an unsettled state, since they are of the first importance in the preparation of gelatine plates. It will be in the recollection of our readers that when Mr. Kennett first brought out his really practicable process the time of emulsification was comparatively short, and we can most honestly say that the plates which we prepared by his method, and also the plates which he prepared for us, were much quicker than wet plates, but certainly not so rapid as those prepared by the later formulæ. Amidst the various improvements in the preparation of the emulsion, photographers are apt to lose sight of the debt that they owe to Mr. Kennett, though it is his process, as published, which has served as a basis for the later superstructures. Mr. Kennett's plan of keeping the emulsion fluid for times varying from one to seven days, at a temperature not over 90°, produces excellent results and extreme rapidity; but there is the great drawback to it, that the operation is long and, in some instances, tedious; in fact, so much so, that we know of several preparers of gelatine plates who tried it and abandoned it from this cause alone. Now, we cannot doubt that the use of this prolonged emulsification is to produce some physical change in the size of the particles of silver bromide emulsified, as a much shorter time would enable a combination to take place between the soluble bromide introduced into the gelatine and the nitrate of silver subsequently added; besides which, if the conversion were incomplete, it would only be approximately so, and the subsequent washing of the gelatinous mass would eliminate any such uncombined salt from the emulsion. If, then, it is merely a physical change that is required, a higher temperature than 90° should affect it in a far less time. Capt. Abney, we believe, was the originator of the method of boiling the emulsion. In his description of his plan for the emulsification of the bromide of silver, precipitated from an aqueous solution, which was washed and then added to the fluid gelatine, he stated that sensitiveness was rapidly attained by boiling the sensitive salt in the gelatine solution. Colonel Wortley also stated he emulsified at a temperature of 150°, and obtained as great sensitiveness in a few hours as he did by a more prolonged emulsification at a lower heat. In our various experiments we have found that with certain gelatines, boiling the emulsion for an hour, or even half an hour, produced the maximum of sensitiveness, and that any extension of the time induced fog, which by some has been mistaken for increased sensibility to the light of the developing-room. The real fact is, that boiling decomposes gelatine to a certain extent, and produces organic compounds, which react on the silver bromide and induce this veil. The emulsification may be continued for a much longer period without detriment if the gelatine, in the first instance, has a slightly acid reaction, which is the case in certain foreign gelatines. We also have reason to think that the introduction of a suitable acid to the neutral gelatines is attended with advantage. There is one more point to which we wish to refer, and that is to the colour of the emulsified silver bromide. There is an idea prevalent at the present time that blue bromide is of necessity the most sensitive. This we demur to. If the silver compound be originally emulsified so as to produce a very fine emulsion perfectly ruby by transmitted light, the emulsion, after any amount of cooking or boiling, will retain a ruddy tint inclining to yellow. There are certain gelatines, however, as there are pyroxylines, which will invariably show a blue film by transmitted light, and a ruby coloured emulsion with them is almost an impossibility. In this case the blue colour is really dependent on the "particular" coarseness, and not on what we may call the molecular coarseness of the bromide. As a result of our experiments, we can unhesitatingly recommend that the emulsion be boiled for half an hour instead of being cooked for three or four days, and that, in the first instance, the silver nitrate and the soluble bromide should be each added alternately, little by little, to the gelatine solution, only one-fourth of the total amount of gelatine being used till the boiling operations are over. This, we believe, will give a plate which, with a tolerable light, and a lens fairly stopped-down, will enable views to be taken with a drop shutter. Beyond this point it seems unnecessary to get rapidity, unless for very exceptional purposes.

RETOUCHING THE GELATINE FILM.

It is strange that while some avow the gelatine film to be very difficult to pencil, others have made no complaint against the new plates on this score. Some photographers employ for retouching on gelatine very hard pencils, such as a four H, or even five H, while others again use points of very moderate hardness, like the H, or HB; but most agree that only pencils of the first quality and of certain makers are suitable for the purpose, since these alone give a sufficiently fine point. The well-known firms of E. Wolff and Son, of Keswick, and A. W. Faber, of Nuremburg, appear to be the only manufacturers of pencils that photographers can use.

There are two ways of rendering gelatine negatives proper to retouching; the first is to treat the surface with some gum or spirit, and the second to abrade the film and impart a tooth in this fashion. The first method is that in general practice, at any rate in this country. In the case of negatives from which an ordinary number of impressions are to be taken, it is usual to varnish first and retouch afterwards, but when a photograph is wanted for publication, and considerable pains and expense are devoted to retouching it, then the varnishing is done afterwards, so that the work upon the negative may be protected. Adam-Salomon advocates retouching on both sides of the negative. Only freckles and minor imperfections are treated with a fine-pointed pencil on the negative film itself; the broader effects of retouching take place on the reverse. The glass is covered with a matt varnish, and the artist does most of his work on this.

Turpentine is employed by some to prepare the film for retouching; a little of the liquid is applied with the finger, and the film may be retouched as soon as the surface is dry again. In this case, however, hard pencils are necessary to do the work. One gentleman we met the other day told us he still employed gum-water to give a film for retouching, as he had done, he said, for twenty years; but a great many nowadays follow Mr. Mayland's example, and employ the Autotype medium, which renders the gelatine film as easy to work upon as one of collodion. "You may pencil the film like paper," Mr. Mayland says, "if you use this medium, and if you do not like your retouching afterwards, you may remove it without the least difficulty by means of the finger dipped into the liquid."

Notes.

Mr. Spiller is making a chemical examination of brown mounting boards, and will publish the results of his research in these columns next week.

It will be remembered that some of these mounts have acquired a very bad reputation, and special attention was called to them at Edinburgh last month by Mr. Marshall Wane and others; it is high time, therefore, that their character should be enquired into.

Mr. Walter Woodbury sends us a delicate cabinet portrait, produced by his photo-relief process modified by himself. His modification, he believes, will permit the process to be worked universally, and without much expenditure in apparatus or plant.

There have been several attempts lately to take photographs of theatrical scenery, but our readers may not be aware that theatrical scenery is sometimes taken from photographs. A burlesque of "William Tell," produced a short time back at the Gaiety Theatre, contained a very charming glacier scene, which was painted from one of Mr. England's photographs of Swiss scenery.

"Their photographs are finer than the English, because the air is so very much clearer over there," is a criticism of foreign pictures that every photographer is familiar with. Even Mr. Lansdell, the other night at the Photographic Society, although he proved himself an able critic in many respects, could not refrain from uttering the hackneyed phrase. And yet, if British photographers shine at all, it is precisely in landscape work that they have made a mark, and because of the *atmosphere* of their pictures. So there must be a mistake somewhere. We, for our part, explain the reason of British supremacy in landscape work to the fact that the English lenses that are generally employed abroad are not used to the climate, and do not operate so fairly in a foreign atmosphere. At any rate, this reason is as good as the other.

In Berlin a patent liquid is sold in small bottles, at the price of a shilling, for removing nitrate of silver stains from the skin or from linen. It is called *Antiargentine*, and though its composition is as yet a secret, it is guaranteed not to contain potassium cyanide.

The following curious observation, which recalls the phenomena noticed by Niepce de St. Victor, has been communicated to the Liège Section of the Photographic Association of Belgium by M. Laoureux. If two gelatine plates, one of which only has received an impression in the camera, be placed face to face at a distance of about half a millimetre, and left in that position for a short time in the dark, both, on development, will be seen to bear the image. They are, in fact, two negatives of equal intensity, one, of course, being the reverse of the other.

We alluded the other day to a photograph of Kew Church, obtained by the bitumen process by Nicéphore Niépce, the first authentic picture secured in the camera in this country. This was Niépce's plan of working, as described in his own words:—"I first take a metal plate, either of tin, copper, or silver (but I prefer the first), and this I coat with a film of bitumen of Judea, which is sensitive to light; I then expose the plate in the camera, and afterwards wash it in oil of almonds, to render the picture visible. I also use iodine to render the image more black."

Now, here is something to think about. Niépce, it is well known, entered into a partnership with Daguerre—in fact, the deed of partnership is still extant—and they worked together for two years, when Niépce died. How far was Daguerre indebted to Niépce for Daguerreotype? As described by Daguerre, the process is divided into four operations:—1, to clean the metal plate; 2, to render it sensitive; 3, to expose it in the camera; and, 4, to develop the image. But whether Daguerre took any hint or no from Niépce, who certainly talks of the employment of metal plates and the use of iodine, it is very obvious that Niépce, by his bitumen process, secured a permanent picture in the camera long before Daguerre succeeded in doing so.

We are glad to see that Mr. Werge announces another edition of Jabez Hughes's "Principles and Practice of Photography." A simple shilling hand-book of photography is a great *desideratum*.

It is not so easy to varnish a map or diagram as some people believe. If the plan is of paper, it should be carefully stretched, and then a solution of isinglass applied by means of a brush. Very little should be put on at a time, for if there is a surfeit, or the paper gets wavy, brown ridges are the result. Isinglass is better than gelatine, because it is usually more colourless, but good gelatine does very well. When perfectly dry, the gelatinous covering receives a coating of varnish; paper or any transparent photographic varnish will do. A map or plan treated in this way will bear washing.

The Paris apparatus makers are busying themselves to devise a means of developing gelatine plates in the daylight; already an apparatus of the kind exists in this country—elaborated, we think, by Mr. Werge—but we have no personal experience of it.

No doubt, if a practical developing box, or something of the kind, could be devised for gelatine plates, it would find a sale among photographers, and amateurs especially; but the worst of it is, apparatus of the kind is apt to degenerate into mere toys, which are quite inconsistent with serious work, and are only likely to find purchasers among novices in the art; and Paris makers, unfortunately, are usually connected with such technical playthings.

The Dubroni apparatus, which is probably familiar to many of our readers, is a very good example of what we mean. It is camera, lens, dark box, dipping bath, and developing trough all in one; too costly for a toy, too impracticable for work. The inside of the camera is of glass; you focus the object, take out the ground glass, and substitute a collodionized plate. This collodionized plate is not yet sensitized, so you put some silver bath in at the top of the camera, and tilt the apparatus backwards to excite the plate. Subsequently the silver solution is withdrawn by a rubber bulb, and the camera being put once more in position, the plate is exposed. The development is proceeded with in the same way as the sensitizing, namely, by the introduction of a solution of iron from above, and by tilting the camera backwards. Finally, the developed plate is withdrawn for fixing, and the camera thoroughly washed out. Our readers will agree that a thorough washing is certainly necessary, if the next negative is to be sensitized with success.

We doubt if many pictures were ever taken with the apparatus, although at one time it commanded a good sale, both in this country and abroad. The best thing we know of the Dubroni camera was told us of a Parisian amateur, who was returning with it by rail, one hot summer's day, after an unsuccessful morning's work. He got into the train at Fontainbleau, to go to Dijon, placing his camera-stand in the netting over his head, and the camera itself in the rack opposite. At one of the bye-stations there entered a *Provençal*, stiffly attired in evening dress, and with a great display of starched shirt, evidently a country Maire, on his way to dine with Monsieur le Prefet. The sun was hot, the atmosphere in the carriage very close, and the Maire, extending himself in his grandeur opposite, fell fast asleep. Presently the photographer heard a sound very similar to that of rain-drops pattering on the tiles; he sat up and listened. There could be no mistake; it certainly was liquid dripping on a hard substance. He looked round, and, to his dismay, found that his wretched *Appareil Dubroni* had not been emptied, and was dropping its contents merrily upon the shirt-front of the sleeping Maire. Whether it was silver bath or developer the photographer never stopped to enquire, but wisely left the apparatus to its fate at the very next station.

At the State Trade School (*Staatsgewerbeschule*) of Salzburg, a separate division has been established for practical instruction in the processes for copying and reproducing drawings and illustrations of all kinds, both of those used for technical purposes, and those intended for artistic publications. In the general division of the school the students are taught the arts and sciences, such as physics and chemistry, freehand and perspective drawing, modelling, &c., which they afterwards apply in the above-named practical division. As may be supposed, the photographic processes hold a prominent place in the course of instruction—not only carbon and pigment printing, but the mechanical printing processes. Photo-lithography, photo-xylography, photo-zincography, and photo-electrotyping are here all studied and demonstrated.

Topics of the Day.

MOTIVE IN PHOTOGRAPHIC PICTURES.

BY GILBERT FANE.

The reason why photographers often fail to make portrait pictures—or pictures in which the human figure occupies a prominent place—is because they do not sufficiently study "motive," and photographers, unfortunately, have a very narrow choice of motives. The camera compels them to photograph only what may be termed still life, and still life is only possible in a certain class of pictures. No doubt the rapid gelatine plate will permit them to do more than formerly, but their hands will always be tied down fast and firm, and they cannot go beyond what may be termed, for want of a better name, suspended animation. A painter may paint a very good picture of a boy bowling a hoop, the body in motion, while the features are pleasing, clear, and exact. But the photographer cannot do this. With a gelatine plate he might skilfully catch the boy as he runs, but it would be impossible to secure a good portrait study at the same time, with the features suitably lighted, and with the best aspect of the face. With a drop shutter and a very sensitive film he could secure a technical result, but nothing more.

I can make my meaning more clear by a few examples. One of Robinson's well-known studies is, I think, called "The Entomologist;" it is a fine landscape picture, with but one figure, and this little figure has a net posed in her hand ready to strike a butterfly. The figure must necessarily be very still, for that is the motive of the picture, and stillness being also necessary to take the photograph, the latter has obviously in it the elements of success. There is animation, but it is suspended, and only under these circumstances, when the motive coincides with the exigencies of the photographer, can a successful photographic picture be secured. Another of Robinson's pictures, "When the Day's Work is done," shows an old couple, the one, an aged labourer, reading, with his finger on the page; the other, a dame, who has momentarily stayed her needle to listen to the words her husband is reading. Another picture of Robinson's I hold to be less successful, but since it gained for its author the gold medal of the Paris Exhibition, he may well afford to disregard my humble opinion. In this study of an interior he shows two girls arranging flowers for market. The details and lighting are beyond praise, but he has been unfortunate in his principal model—she is not arranging or sorting flowers, but holding still a moment, for no other purpose than to have her portrait taken.

Turning to Rejlander's studies, we find that he comprehended very clearly what photography could do and what it could not do in the way of making pictures. His motive was clear, and it accorded with the exigencies of the camera. "Did she?" is a good instance. One man whispers into the ear of another some ridiculous story; we have the full face of the recipient of the story before us, and the merry mouth is already laughing, although it is obviously expectant of the good thing at the end of the anecdote, and awaits this before bursting out into a final guffaw. Another of Rejlander's studies, quite as funny and successful, is, "The dear creature is looking at me," a sly old joker at a window, his hands screening his face, who has just caught a glance of a neighbour opposite, and is screwing up his face in exultation. In "Is it True?"—a girl with a pensive face looking up from a book—the motive is more delicate still, and I feel sure that in nine cases out of ten a photographer trying to repeat the picture would only succeed in getting a girl in the act of having her portrait taken.

Nesbitt, of Bournemouth showed a very successful picture a little while ago of a little child bending down to a rough dog and feeling the animal's coat with her face—a motive that had been most artistically carried out by photography. To take another example at random, in

illustration of my remarks, I may mention a picture by Mr. Cobb, of Woolwich. It is a group of two girls, the one arranging flowers in the hat of the other. The motive here is clear: both must be still for the moment, and in the picture we attribute this stillness, not to the fact that it was necessary to the taking of the picture, but to the arranging of the flowers in the hat.

A German picture, as a last example, I may mention. It is a group of three workmen in their shirt sleeves; they have a bottle of wine, and the centre figure has already filled the glasses of his comrades on either side, and these now await the filling of their friend's own glass prior to having a bumper together. Their smirking faces, as they look towards the centre man, waiting till he has filled, show plainly enough that wine does not come in their way every day, and that it is something of a joke, this taking of a glass together. They are standing still, not to have their portraits taken, but only because their comrade has not yet filled up his glass.

The photographer, then, I hold, can scarcely be successful in pictures of groups or figures unless he employs a motive, in which still life or suspended animation plays a part. How many times do we hear the remark, "Yes; it is very like him; the pose is good, and so is the lighting; but he is having his portrait taken." If the sitter is obviously having his portrait taken, then the picture can have little claim to be an art production, but represents only the knowledge of technical skill upon the part of the photographer. At the same time, it is equally obvious that motive, although one element of success in photographic pictures, is but only one, after all.

The "Topic" for next week will be "Brown Mounting Cards, Chemically Considered," by John Spiller, F.C.S., F.I.C., &c.

FRENCH CORRESPONDENCE.

PROCEEDINGS OF THE PHOTOGRAPHIC SOCIETY OF FRANCE AT THE MEETING OF MARCH 5TH—NEW LANTERN FOR USE IN MANIPULATIONS WITH GELATINO-BROMIDE—IMPROVEMENTS INTRODUCED BY M. COLAS INTO THE MANUFACTURE OF HIS FERRIC CHLORIDE PAPER—METHOD OF FACILITATING THE FLOWING OF GELATINE OVER GLASS PLATES—EXPERIMENTS OF M. DAVANNE—PRIZE OFFERED FOR THE INVENTION OF THIN SENSITIVE FILMS AS A SUBSTITUTE FOR GLASS PLATES—M. MICHAUD'S PHOTOTYPOGRAPHY—M. VIDAL'S PHOTOTYPIE APPLIED TO ZINCOGRAPHY.

New Laboratory Lantern by M. Stebbing.—At the meeting of the Photographic Society of France, on the 5th of March, M. Stebbing exhibited a new lantern for lighting a laboratory where operations are carried on with gelatino-bromide. This lantern consists of a truncated cone of tin the inner side of which acts as a reflector. The smaller end of the cone is upwards, and carries a chimney; the larger end, or base, is formed of a disc of orange-coloured glass. This glass disc moves on a hinge, and, when turned down, a lighted lamp is introduced into the lantern, and placed directly on the disc, which is then again closed and fastened with a bolt. The whole lantern is suspended from the ceiling, so that the only light which issues from it must pass through the non-actinic glass; the distance to which the light is distributed in the room depends, of course, on the height at which the lamp is hung. With this apparatus the means of operating in the laboratory are greatly facilitated, and there is a notable gain of space.

Improvements in the Manufacture of Ferric Chloride Paper.—M. Colas has invented a machine for the manufacture of his ferric chloride paper. By the aid of this machine, which is similar to the one used in making carbon tissue, the inequalities observed in the paper produced by hand are avoided. With respect to the preservation of the sensitiveness of his paper, M. Colas believes that it is best effected by keeping the paper free from contact with the atmosphere. By placing the sheets of paper between layers of caoutchouc under considerable pressure, he has succeeded in preserving their sensitiveness to such an extent, that some weeks after manufacture they gave as good prints in gallate of iron as those which had been quite recently prepared. This method has certainly its advantages, but I do not see how, in the case of the paper being on sale in a shop, room could be made for keeping a large stock of it, when preserved in this way, free from access of air or moisture. The plan adopted by M. Colas is, therefore, only available in a laboratory where the paper is made on a small scale, and, as a general rule, it will be better to prepare this ferric chloride paper as it is wanted.

Cleaning Glass Plates to make the Gelatine flow freely over them.—The difficulty of running gelatine emulsion evenly over glass plates has been surmounted by the manufacturers, but still gives amateurs considerable trouble. M. Andra believes he has found a method for coating glass plates with gelatino-bromide as easily as with collodion. He pours a few drops of a solution of sugar in water on the plate, and rubs the surface dry. The sugar is distributed all over the plate, though every trace of it disappears to the eye. Nevertheless, when the gelatine is dropped on the plate, it is seen to flow evenly over the whole surface, and the excess of liquid may be poured off at one of the corners, as is commonly done with collodion. By this means the thickness of the film of gelatine may be regulated according to the rapidity of the flow. I do not wish to dispute the correctness of M. Andra's result, but, as the plate on which he experimented at the meeting was one of a small size, I should like to see the same operation performed on large plates—say, thirty by forty centimetres. In my opinion, the size of the plate is an important factor in the case.

Serviceableness of Collodio-bromide after Exposure to Light.—At the same meeting M. Davanne gave an account of a number of experiments, recently undertaken by him, the result of which was to overthrow the correctness of a great many generally accepted ideas. For example, he stated that he had exposed sensitive collodion emulsion for a tolerably long time to the action of light, and had then used it for coating plates. With these plates he obtained very fine results in the camera. Collodion emulsion plates he had also allowed to see the light, and then by exposing in the camera and developing he had taken negatives more or less fogged; but when he tried to cure the fog by means of strong iodine water, some of these plates gave him contrasts which were almost too strongly marked. In M. Davanne's opinion, therefore, sensitive films which have accidentally become exposed may still, in certain cases, be of use. Of course, it is not to be expected that plates of this kind will give as good results as those in the normal condition, but it is important to know that, in case of accident, all is not necessarily lost.

Harmlessness of Hyposulphite in the Developer.—It is generally held that hyposulphite of soda, accidentally introduced into the developer, is fatal to the action of the latter. This accident happened to M. Davanne, but notwithstanding the presence of the noxious ingredient he succeeded in developing very good negatives. He therefore undertook a series of experiments, with the object of ascertaining to what extent traces of hyposulphite might exist in the developing solution without producing injurious effects on the negative. He arrived at the conclusion that this amount ought not to exceed the quantity sufficient to produce the effect of fixing by dissolving the silver iodide of the emulsion. Moreover, he discovered that the presence of hyposulphite in the developer,

more especially in the case of transparent positives, gave a warm brown tone, much more agreeable than the tone produced by the ordinary ammoniacal developer. M. Davanne passed round the meeting some of the results he had thus obtained, and the more or less warm tone of the negatives, in proportion to the larger or smaller quantity of hyposulphite used in the developer, was easily recognized.

Developing Trays in Metal.—M. Davanne also exhibited a number of developing pans that he had had constructed in various kinds of metal—lead, iron, copper, tin, zinc, aluminium—with the object of substituting them for the heavy and brittle porcelain dishes in common use. If these metal trays are equally available for developing either with the ammonia or pyrogallic acid developer—as M. Davanne has found them to be—they will be of great service to travelling photographers. The presence of ammonia in the solution may have an injurious action on the copper tray, but not to such an extent as to affect the photographic result. Generally the zinc trays are found to offer the greatest advantages.

The Collodion Processes.—It seems that M. Davanne is occupying himself more especially with the processes depending on the use of collodion. He appears not to wish this substance to be altogether neglected in favour of gelatine, though the latter does give more rapidly working films. This rapidity is, in his opinion, a great advantage, but it must not be forgotten that gelatino-bromide plates take a much longer time to prepare and dry. Collodion emulsion plates, though they are less rapid, are much more easy of preparation, and offer great advantages to open-air photographers. In the photographic, as in other arts, we are compelled to act according to circumstances, and to have recourse to any process which promises to give a good result under the special conditions to which we may have to submit.

Prize for the Invention of a Support to Supersede Glass Plates.—It was announced at the meeting that M. Gaillard had offered the Society a sum of 500 francs with the object of founding a prize for the invention of the best unbreakable but pliable medium to replace glass as a support of the sensitive film. The competition for this prize will be open from the 1st May to the 31st December of the present year. The negative sensitive tissue of M. Warnerke is of the nature of the substance required, and others have also made investigation in the same direction. M. Ferrier's, and (before him) M. Stebbing's pellicles are cases in point. The invention of a sensitive pellicle of this kind, capable of being produced on a commercial scale, cannot fail to have an important effect on the progress of our art.

Photo-typography by M. Michaud.—M. Michaud has applied his process of photo-engraving to the production of typographic plates. A proof taken by this method was shown at the meeting, but the result is not conclusive, and the author of the paper himself only put it forward as a first essay.

Phototypie applied to Zincography.—With reference to this process, it may be of use to refer to what I have already stated on the subject of an impression by phototypic on grained paper, taken in such a way as not to reach with the fatty ink the bottom of the depressions between the grain. A proof of this kind, retouched with the scraper for the whites, and with the brush for the blacks, would yield a negative admirably adapted to the purposes of zincography. A similar effect might be produced by the help of certain woven fabrics transferred to a white ground, and the necessary gradation of tint might be rendered by hand. LEON VIDAL.

NORTHERN NOTES.

BY JO. VESTRIS.

MINIATURE painting and enamelling require great refinement of taste, dexterity and delicacy of hand, and patience in the artist. Their history dates back to the first century; but a limited period of the present century will suffice for the subject of my present remarks. Miniatures by English artists have always held a foremost place, and this has been freely admitted by foreign critics. Some of the best of our living miniature-painters have wholly or in part abandoned the practice of this branch of painting, and, says an authority, "others of an inferior order are devoting themselves to painting photographic miniatures, or miniatures of which the basis is a feebly developed photographic positive." Now that the carbon process is emancipated and disenthralled by the universal genius and wonder-worker Time, we may expect to hear no more the mention of a "feebly developed photographic positive." The Glasgow Photographic Association will now go ahead, we hope, and form a *work* committee, the *watch* committee having proved a total failure. The late J. M. W. Turner would have put the Glasgow Association down on the toast-list under the heading of "Painters, Glaziers, and Paper Stainers."

One of the first and foremost enamellers a few years ago proposed to divulge his secret process of enamelling for a valuable consideration, but the necessary enthusiasm was not manifested nor fostered. Eventually his process was patented, so that the principles and ingredients in the composition are publicly known; but the proportions in which they are used, the degree and continuance of the heat required for their perfection, though no secret, are at least the result of skill in manipulation not to be acquired very soon; in other words, enamelling is indeed a fine-art. Robert Mackenzie has written the history of the nineteenth century in a very condensed form; photography comes in for twenty-seven lines, but not a name is associated with the discovery. Perhaps Robert Mackenzie thinks with Niećphore Niépce, of honoured memory, that "it took itself," and not only forty years ago, Mr. Mackenzie, but fully fifty years ago.

About the year 1857 glass positive work was in full swing, but the portraits being reversed they presented strange anomalies; every soldier was represented in a left-handed aspect as to medals, swords, &c., and the gay coxcomb who *didn't* part his hair in the middle could never see "his true likeness." Although not generally in practice, it was in 1857 that reversing the collodion plate was given out to rectify this evil; but who gave out this simple idea? Many may now lay claim because of its modern importance in connection with carbon printing. Now that dry-plate work is in the ascendant, it is possible for single transfer carbon printing and reversed gelatine plates to dovetail into each other, and thereby become a mode of procedure which may be very largely adopted.

R. Kennett's patent pellicle is being imitated and advertised as "dry sensitive gelatine" in a local weekly organ. Mr. Kennett should be proud.

PRACTICAL EXPERIENCE WITH GELATINE PLATES.

BY GEORGE GREGORY.*

WHEN I spoke to our worthy secretary (Mr. W. J. Chadwick) about this subject, my intention was just to say a word or two in reference to a few prints I intended bringing. However, he chose to understand I meant to read a paper, and therefore I felt in duty bound to comply as far as I could.

So much has been written about this subject, both theoretical and practical, that it will be difficult for me to break new ground, or interest you to the extent I could wish. I have brought certain specimens of work (done on

* A communication to the Manchester Photographic Society.

gelatine plates) for your inspection and criticism. They have been chosen with the intention of showing the great diversity of effects obtainable by modifying the development. Of course I now speak of pyrogallic development, which I almost invariably use.

The chief difficulty in writing a paper of this character arises from the fact that one is almost compelled to state many things that may be perfectly familiar to most of you, but still not known to all. It goes without saying that in taking in hand a process like gelatine—so different to collodion in its physical character—many mishaps may arise if we are not careful and proceed thoughtfully to work. Soon after I commenced using gelatine plates, I unthinkingly made up some hyposulphite for fixing, and used hot water to effect solution. Certainly I did not put in the plate while the solution was hot, but I placed it there before it was quite cold, the result being the loss of what seemed a very good negative.

The next mishap occurred by reason of the film expanding from carte to cabinet size. The plates were not given to any tricks of that kind previous to this particular instance, so the rest of the plates for that day were treated with alum, which proved a cure. I attribute the occurrence to the room being overheated by the gardener who attends to the heating apparatus.

The next blunder was by reason of the assistant placing the negative too near a fire to dry, the consequence being the slipping of the film in a most grotesque fashion. Having learnt caution by these mishaps all goes smoothly, except now and again a decided error in exposure. A slight error in that direction can be rectified (as I mentioned in the beginning of this communication) by modifying the composition of the developer. You will please take my remarks for what they are worth, but I have proved them in my own case, and so have confidence in them.

We will suppose that on applying the developer it is found the plate is over-exposed. Wash off at once, and apply a developer containing excess of pyrogallic; if under-exposed, add a few drops at a time of the bromide and ammonia solution. I find most plates will stand without detriment thirty or forty drops. Of course, if you know beforehand that your plate is under or over-exposed, modify the development at first, which will give a much better result than if left until the action is fairly commenced. There are many little points arising from time to time which must be left to the judgment of the operator.

Now, a few words in reference to which is the better process—gelatine or collodion. I have seen opinions in the journals differing widely, some preferring collodion and some gelatine. My opinion is that there can be no fair comparison between the two, for the reason that with gelatine things can be done it would be foolish to attempt with the collodion process as ordinarily worked.

If I were asked to give up the collodion process altogether, my answer would be—"No!" I prefer to have two strings to my bow rather than one. The pictures I have brought to-night are just prints from the negatives without any spotting, so they are capable of being improved; but they will serve to show what can be done by gelatine in the ordinary course of business.

In conclusion, I am pleased to be able to state that a few of the prints are from negatives produced on plates prepared by Mr. T. Chilton, who forwarded some plates for me to test. Any questions occurring to members I shall be glad to answer to the best of my ability.

I may just mention the plan of developing I like best. I have made a deep wooden spoon, which I find, under ordinary circumstances, to hold enough of pyrogallic without the trouble of weighing. I place an exposed plate to soak for a minute in rather over two ounces of water, during which time I put into a measure the quantity of pyrogallic, and pour the water from the plate to the measure and back again. I then measure the bromide and ammonia solution, pour again from the plate to the measure and back again, when all proceeds as smoothly as possible if the exposure have been anything like right.

Correspondence.

RUBY GROUND GLASS FOR THE DARK-ROOM.

Dear Sir,—It was a curious coincidence that on the same day when I received the proof of an article written for the *Philadelphia Photographer* for March, on the superiority of ruby ground glass for the dark-room when gelatino-bromide plates are to be developed, I received your paper of February 13th, containing the same suggestion by one of your correspondents. Your issue of February 27th recommends light ruby with orange. I would suggest that in all cases the surface of one of the glasses be ground, as it softens and diffuses the light transmitted, and deprives it of the dazzling effect which always accompanies ruby glass, or ruby and orange combined. You will be surprised by the contrast between the ground and the unground ruby.

Of course, there is no fixed rule which can govern all studios and dark-rooms, as they differ widely in means of external illumination, so there must be an equally wide difference in the means of protection against the fogging of the gelatine plates. Where direct sunlight is to be shut out, two thicknesses of dark ruby ground will sometimes be necessary, and yet admit light enough to work by. If this be too dark a screen, the operator can make experiments until he comes down to the right combination, which shall solve the problem of admitting light sufficient to work by and cutting off actinic effect sufficiently to prevent fogging. He can try two lighter tints of ruby, or one ruby and one orange, or ruby and yellow, or one ruby, in all cases having one surface ground, to obtain its mellowing and diffusive effect. There are many tints of red in the different sheets sold by glass dealers, and sometimes different tints in the same sheet. And so it is a mattter of experiment with each photographer to decide whether to use dark or light ruby, and one or two thicknesses. I think that all will acknowledge the value of grinding one surface. It may be well to correct here a very general error in reference to ground glass, viz., that it transmits more light than clear glass. Grinding always cuts off a considerable proportion of the light transmitted by clear glass. But at the same time, in a room glazed with ground glass, the lesser amount of transmitted light sometimes appears greater, because it is diffused more equally throughout the apartment, instead of being chiefly confined to a space near the window. The smooth surface becomes by grinding an infinite collection of little facets to transmit and diffuse the needed light.—Yours truly,

Boston, March 15. Thomas Gaffield.

SHADOW PICTURES.

Dear Sir,—Under this heading you have published a very curious statement from another paper in your issue of February 27th. No expert in glass making would make any positive statement on the subject without seeing the glass for himself, and therefore I will only give a Yankee guess. The lens in question has probably been rendered imperfect by the operation of what the glassmaker calls rusting, and the imagination of the observer creates the forms of stars and leaves and branches referred to in the article. The writer says, "the shadow pictures have the appearance of being ground into the glass, and they are immovable, every effort to remove them from the lens having failed." This is often the identical action of rust. It gives the appearance of a ground surface, which cannot be removed except by a repolishing of the glass. Let the lens in question be repolished, and there will not be even a shadow of a star or leaf left upon its surface or within the body of the glass.

I think the story may well be classed with those other ridiculous ones which you may have seen about the portraits of persons impressed on glass by a flash of lighting. I once saw a rusty piece of glass which a deluded or a dishonest showman was trying to palm off upon his audience as produced in this manner.—Yours truly,

Thomas Gaffield.

PREPARATION OF DRY PLATES.

Sir,—I have looked in vain in my News and Year-Book for a sketch of a drying cupboard. I wish to make my own dry plates up to fifteen by twelve; would you or some of your readers give me a slight insight how to make one? I think there are more than myself who would be thankful for it.—Yours, &c., Pyro.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday, April 6th, at the Gallery, 5, Pall Mall East, when a paper "On the Optics involved in the Construction of the Magic Lantern; and on a New Lantern-Lens or Objective," will be read by Mr. J. H. Dallmeyer, F.R.A.S.

Photographic Action.—*Heath v. Jones.*—In this case the defendant was called upon to show cause, under a judgment summons obtained against him at the instance of Mr. Vernon Heath, a photographer of Piccadilly, why he should not pay the plaintiff the sum of £5 odd for work and labour done, as stated in the particulars before the Court. The merits of the case having been gone into on the former hearing of the case, Mr. Heath said that the judgment summons was served personally on the defendant. In reply to the learned Judge as to the defendant's means, Mr. Heath said that the defendant resided in good style at Bolton Street, Mayfair, and was proprietor or part proprietor of race-horses, and a member of the Army and Navy Club, and was in a position to pay the debt. The plaintiff said he did not know the defendant's Christian name; he only knew him as Captain Jones, and as there was no other Jones living at Bolton Street, he had no doubt the defendant was properly served. Upon hearing this evidence, his Honour gave judgment in favour of the plaintiff for the full amount claimed, with costs, and ordered a warrant for the defendant's commitment to prison for twelve days, unless debt and costs were paid. The warrant to be suspended a fortnight.

To Correspondents.

George Sharpe.—Yes, you may use them wet, but there is no advantage gained. 2. The Platinotype Company will supply you. Write to them.

J. East.—We do not, as a rule, give such opinions, but we have made an exception in your case. The wall-paper you send certainly does contain arsenic. Take a clean test-tube and put in it a slip of your paper with some hydrochloric acid; boil, and then pour the acid into another tube and put in some pure copper turnings. You will find a black deposit upon the copper after warming again; this is evidence of the presence of arsenic. But you must be quite sure that your copper is pure. You can now test other samples for yourself.

J. J.—It is not so easy to dissolve india-rubber in benzole. Get some masticated rubber—that, is rubber whose fibre has been thoroughly broken up—and try again. Ordinary rubber will only swell like gelatine in cold water, but will not dissolve. Warming will facilitate the solution, but be very careful, for benzole is highly inflammable.

Micro.—It is a collotype print—that is, an impression printed off from a colloid film such as gelatine. *Photo-typie*—or, at any rate, photo-type—is a misnomer; the typographic press has certainly not been used in its production. See our "At Home" this week.

Silver Printer.—Smell is not a criterion of its quality; there is, no doubt, a large quantity of questionable albumenised paper in the market; and much of it, in all probability, comes from abroad; but smell, we repeat, is not, from a chemical point of view, a sign of inferiority.

L. L.—We can only refer you to our advertising columns. We have correspondents in Berlin, but we could not trouble them about the qualifications of an assistant, unless he especially referred to some well-known names. Germans are very apt retouchers, but because he is a German, it does not follow that he knows his business.

Glass.—We only know one studio built with blue-tinted glass, and that is at Vienna. Ground glass is more generally used than before. Messrs. W. and D. Downey are building a ground glass studio. Blanchard secures the same softness of illumination by employing screens of *papier mineral*, which can be had of Marion and other dealers.

Tyro.—Certainly not, if you register at Stationers' Hall; fee one shilling.

Lal.—No, not in London. There will be an annual exhibition as usual at Pall Mall this Autumn; but the date has not yet been fixed.

J. Morgan.—If you like to send it to us, we will do what we can.

Mount.—You can easily find out whether it is starch or not. Make a solution of iodine, by adding a few crystals of this material to an aqueous solution of iodide of potassium. If there is the slightest trace of starch present, the iodine solution will turn it blue.

Strephon.—Nut-gall solution and sulphate of iron will certainly make writing ink, but probably not so good as you could buy at a stationer's.

Calendar.—Wash the linen in warm distilled water to remove any dressing; when dry, the fabric is stretched and mangled, to render it smooth, and albumenized with a mixture of—

Chloride of ammonia	2 grains
Water	250 c.c.
White of two eggs.	

The silver bath should be rather strong, about seventy grains to the ounce of water. The fabric is floated for five or six minutes, and when dry is easily manipulated in the printing-frame. It must be rather over-printed, as it loses much in toning, and it should be toned and fixed as soon as possible; the whites of the picture are not fully restored till the print has been fixed. The operations of sensitizing, printing, toning, and fixing should be all carried out in one day.

W. Norman.—Write to Messrs. John Berger Spence and Co., 31, Lombard Street; they will give you all the information you want on the subject of Spence's metal.

Biblax.—Any good sample of gelatine, such as Nelson's, will do. Gelatine will swell very much in an atmosphere impregnated with moisture, or you may immerse in *cold* water, when it will also swell without dissolving; you may immerse for several hours. Probably you will find a five per cent. bichromate solution answer your purpose.

Debutant.—We will enquire, and doubtless shall be able to get you the information by next week.

A Young Hand.—We should think the spots were due to the paper itself, unless, when sensitized and wet, you allow dust to settle. Try another fresh clean sample on the same bath; if they still appear, it is the paper, most likely, in fault.

R. Gordon.—Of course, if you reduce your water, that is equivalent to making your solution stronger. Add a little more oxalate, and you will, no doubt, improve matters. We shall publish, in an early number, a paper on the subject by Dr. Eder, which will give you much information on this point.

Puzzled.—The intensifier you employ has answered in our hands, but, unfortunately, commercial dry plates are differently prepared by different makers. As you employ Wratten's plates, you might do well to follow the advice Mr. Tulley gives in the News for the 2nd January; it is practical and effective.

Thos. Gaffield.—Thank you for your communication.

W. H. P.—Liquor ammonia diluted will do very well, and you may soak in the solution as you suggest; take care, however, that your wash-leather is free from French chalk, &c. Glass that has been used over and over again certainly requires more severe treatment, but if the old film leaves readily, ammonia, a little stronger than usual, will do.

Captain Turton.—The film you send is certainly gelatine, and not collodion. Other answers next week.

Amateur.—A wax or oil coating of some kind should be applied first of all, and then there is no difficulty about getting your picture properly developed. Any solution of wax will do—turpentine, ether, or benzole. You could easily scrub the film off again if unsuccessful, if you don't varnish it.

W. Barrington.—We can find no fault with the formula you send, and it ought to be successful. Plates polished with talc should answer the purpose. Try more wax, and when you get film to peal, reduce it again.

A. B. J.—Hydrated oxide of potassium or caustic potash is probably what is meant, and the manufacturer of this, you will find in any handbook on arts and manufactures. At present there seems little prospect of doing away with ammonia in alkaline development.

W.—Thank you for your communication, but we think spectroscopic science has advanced more than you imagine of late.

The Photographic News, April 9, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

A Strange Work for a Lens—Photographic Lectures—A Peer as a Professor—Central Institution for Technical Education.

A Strange Work for a Lens.—The other day, in a well-known studio, an alarm of fire was raised. Luckily but little damage was done, so the occupants can afford to laugh, though it might have excited other than risible faculties had matters proceeded a little bit further. The origin of the embryo disaster was a lens, which had been left, during an hour devoted to gastronomy, on one of the usual studio accessories. The sun was bright at the time, and during the absence of the operator it had travelled towards the west, and by chance the rays of light fell on the lens, and, by a still more singular coincidence, a black blind, used for studio purposes, happened to be in the focus; the consequence was, that a circular patch was burnt out of the material, and a smouldering ring was extending outwards when the room was re-entered whilst a small disc, rather larger than the sun's image, was alight in the framework of the side-light. The diameter of the lens was somewhere about four inches, and of a focus of some three feet, and the image of the sun being about a quarter of an inch, or more in diameter. It would not be very hard to calculate the heat which fell on the blind first, and afterwards on the wood-work, since a shrewd guess has been made regarding the sun's temperature. In connection with the above, a story was related of a similar occurrence. At one of the exhibitions held in London there was a gigantic condensing lens of some four feet in diameter, and of about the same focus, which was placed on the south side of one of the galleries. Soon after the opening, a visitor happened to pass the spot on a sunny day, and in a second his coat was burnt through, and his skin scorched. The lens in question was, after this occurrence, quickly made to face a northern aspect. Again, too, fires have been caused by the use of window panes which contained part of the nuclei from which sheet glass is blown. These blobs are frequently spherical in form, and at certain times the sun's rays may happen to focus on some combustible matter, and then a fire breaks out. At any rate, it is well to warn photographers to be careful where they leave their lenses in bright weather.

Photographic Lectures.—Out of curiosity, we went one day with the intention of listening to one of a series of lectures on photography, given at the Science Schools, South Kensington, by Capt. Abney, but, on enquiry, we found that the course had broken down, not through any fault of the gallant lecturer, but owing to the want of an audience. Well, we should have made an audience of one, but having sympathized with Mr. Speaker when, during a recent debate, he was the sole listener to the speech of a certain verbose and dry old Indian in the House of Commons, we were not inclined to torture ourselves or the Captain, so we went away. This reminds us of the story of a certain French professor, who, being paid by his Government to give a course of lectures on some recondite subject, found an audience of three persons awaiting him, and these attended regularly. One day, however, he passed the limit of his hour, and begged grace from those present for another half-hour, which was granted; two remaining to listen, another half-hour was again requested, and, this time, his audience dwindled down to *one*. Inspired by his subject, he begged this solitary individual for just one quarter-of-an-hour more, whereupon the audience replied in French: "A vôtre service, Monsieur. Je ne suis que votre cocher, et vous m'avez pris par l'heure." The professor collapsed. We are really sorry, however, that this series of lectures was allowed to drop owing to want of encouragement. The admission fees were a mistake, being too high for those most likely to attend; a second mistake was to advertise the lectures for successive days; and perhaps eight o'clock was too late. Why should not the same lecturer take heart, and deliver his lectures at some more central place within easy range of Charing Cross? We believe a capital audience would be obtained, and much good should be derived from them. Photographers are often sadly ignorant of anything approaching to theory, and though, perhaps, the lecturer might be a trifle *too* theoretical, yet they would certainly teach the most uninitiated something which might not be thrown away on the practical work of their daily life. If we mistake not, our natural enemies, the Russians, are enthusiastic in the matter of photographic spouting, Mr. Warnerke having been kept till the small hours of the morning, on one occasion, enlightening a never-wearying audience. Perhaps they take to this sort of thing because it is so un-English. The days of attending places of worship and lectures, however, appear to be numbered—in Yorkshire. We have heard of an experiment on a Sunday being made with a microphone placed on one side of the pulpit of a popular Yorkshire minister, wires with telephones attached being carried to sixteen different houses, and all being in connection with one another. The whole proceedings in the chapel—sermon, hymns, coughing, and what not—were heard distinctly, and a certain bed-ridden lady listened to a sermon, a delight to her she had not been able to partake of for a long time previous. Probably photographic lectures will still require the actual presence of an audience, since, at present, the experimental demonstrations cannot be seen, although the voice of the lecturer can be heard beyond the lecture hall.

A Peer as a Professor.—It may not be generally known that Lord Rayleigh, F.R.S., has been appointed Professor of Experimental Physics in the University of Cambridge. The name of Lord Rayleigh is doubtless familiar to the readers of the Photographic News, as he has occasionally communicated to its columns letters containing most interesting matter, more especially in regard to the reproduction of diffraction gratings by means of photography. He succeeded Professor Clarke Maxwell in the Professorship, having been unanimously selected and elected. Cambridge is to be congratulated on its choice, and Lord Rayleigh in accepting the post; the lustre of the peerage is by no means tarnished, but, on the contrary, heightened by one of its rank adopting the noble profession of teaching.

Central Institution for Technical Education.—We are glad to see that the Royal Commissioners for the Exhibition of 1851 have promised a free site for the new Technical College which is to be built by the City and Guilds of London Institute. We have no doubt, now the complexion of the Government is changed, that the Livery Companies will use their best endeavours to dispense advantageously some of the surperfluous wealth with which they are endowed, in the ultimate destination of which, it is supposed, a Liberal Government is anxious to have a voice. Anyhow, whether the City Companies subscribe more handsomely than they have done already, the funds at present in hand or promised are sufficient to make a start with which to build the College. The site offered by the Commissioners is naturally at South Kensington, as it is there alone that they have any land to offer, and though rather away from a central position, yet it has advantages in the space being larger than would otherwise be acquired except at an enormous outlay. What the Technical College is to teach is yet an open question; but if we are to guess from the examinations undertaken by the City and Guilds of London Institute, we may hope that photography will not form an unimportant part of curriculum.

It really would be most desirable that there should be some school where photography can be taught in all its branches. At present, so far as we are aware, the Royal Engineers' establishment at Chatham is the only place where thorough instruction in the art science is given, and, necessarily, this is limited to the officers and men of the corps, or to some few persons who are employed in the Government service. What the Crystal Palace Company has done or is doing we do not know. We heard a rumour that a class was being formed there with the object of a thorough instruction in photography; but even this would be insufficient to meet a definite want, as the cost would often be beyond the means of those who might be desirous of becoming proficients, and of utilizing the knowledge thus gained—perhaps as a means of livelihood.

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."

No. 4.—GROUPS—AN AUGUST PERSONAGE!

THIS is a twelve by ten negative. A group taken out of doors. A round, sharp, fully-exposed picture. You can see they are placed on the lawn in front of a great house. Three are standing behind, five seated in a row on basket-chairs, and one lying—or, rather, lounging—in front. A portico with four Doric pillars, two dome-shaped windows, and trellis-work, make up a characteristic background. Over all there is a soft sort of sharpness that I would draw your attention to. Look at the daisies in the foreground—sharp and clear, so that you may discern every leaflet; behold the columns, not so sharp, yet are they clear and vivid. Last of all, observe the faces and figures of the party photographed! There could be nothing better. Soft, round, brilliant, clear, they stand out in bold relief from their surroundings. And still this negative was not taken by a group lens! It was taken by a triplet view lens—a lens of French make—a lens without a name!

I think that photographers, as a rule, have strong prejudices with regard to the makers of the instruments they use, and I am sure by their own bungling manipulations they very often ban the name upon their lens and blame the maker, when they themselves only are in fault. I know that Ross and Dallmeyer lenses are the best in the market, but at the same time I cannot forget that some of the best work ever I made was done by a Grubbe. I know that the above-named parties' symmetrical and group lenses are the very best to be had; yet I cannot forget that I made a splendid picture with a nameless French lens. By chance you will get a nameless lens worth its weight in gold—that is to say, if you know how to use it; and, again, you may have a lens in your studio for which you paid over thirty guineas, and still not be able to make good pictures. Certainly, if you have a decidedly bad lens I defy you to make a good picture; but in nine cases out of ten it is not a matter of bad instruments, but a matter of brains. There is nothing to be said about the printing of this negative. A good sixty-grain bath and a fair light will produce you some grand prints.

Now for *my* print off the old negative.

It is very nearly four years ago. I was engaged by a Mr. X., in Bury-St.-Edmunds. A strange old fellow was Mr. X. Knew nothing whatever about photography himself, except that he knew a good picture. A man risen from the ranks, but a man that I have a good word to say for. He treated his operators like Christians. On market-day, when we were busy, there were ale and bread-and-cheese, and dinner when we could get away to get it. Mr. X.'s motto was, "If you want work you must feed your workmen." A great many photographic employers seem to forget that.

Well, I had been in his employment over three months, when one day all was turmoil and bustle. There were baths and collodion, cameras and lenses, developers and redevelopers, thumbscrews and tripods to be packed up ready on a moment's notice to go off to his Serene Highness the Nawaub of Lucknow (*alias* the Black Prince's) residence, and photograph a most august personage.

Mr. X. employed three assistants—viz., his son Jack, a Frenchman named Collona, and your humble servant Geo'. When the order came Collona and I were ordered upon duty along with one of the apprentices. M. Collona was most profoundly scientific. He used to drive us frantic in the dark room with his chemical deductions. Like most Frenchmen, he was superciliously polite. "My dear sir," he would say, in his broken English, if you happened to show him an under-exposed negative, "it is not your fault; dere is too moch nitrogen in de atmosphere; dere should be more oxygen, den you would be right." He made out somehow or other that the nearer you were to the roots of trees the more oxygen you were likely to imbibe; and, accordingly, he filled one end of his studio with old trunks until it looked like a clearing in the backwoods of America.

"It clears the atmosphere," he cried; "and when I have once brought my system to *perfection*—when I have proved the utility of having the air charged with the most actinic gas—then every photographer will become his own gasman, and have a machine on the premises."

He has not perfected his system yet.

It was a dull heavy afternoon when we drove over to his Serene Highness's mansion. We gloomily deposited our traps in an odd corner in the hall, and then sat down to tea in the housekeeper's room in a very limp and low-spirited condition. Mr. X. tried hard to be cheery, but made most lugubrious spurts. Collona was silent and thoughtful; while I—depraved fellow that I am—not relishing the 2s. 6d. per lb. Congou, slunk away towards the stables, and smoked a pipe.

By seven in the morning we were all astir, and with the collars of our coats turned down to our necks, were making the best work we could to carry the traps into a dilapidated summer-house that we meant to improvise into a dark-room.

"Dere most be some carbolic along with de nitrogen dis morning?" chattered Collona, as he tried in vain to tack on some yellow paper on the window—he shivered so much that he hammered his fingers just as if they didn't belong to him.

About noon, Collona and I had retired for a short time into a small room situated in a sequestered part of the mansion to have a confidential chat with the butler. He was a most interesting butler—so practical! Directly Collona threw forth a hint that a great many brewers did not understand the different heats that generate the different gases, he drew forth a tankard that would have satiated the thirst of a couple of Life-Guardsmen! We had scarcely time to pass an opinion on its merits, when we were summoned to the lawn—the august personage was ready and waiting.

At headlong speed we reached the summer-house, and I, being deputed by Mr. X. to arrange the group and fix the camera while Collona prepared me a plate, marched up towards the portico to interview two princes, a duke, three earls, a viscount, and a lord.

They were, with the exception of a very old and staid earl, dressed in shooting costume, the august personage being very conspicuous, having knickerbockers with a check as large as church windows.

When I first appeared on the scene the august personage was having some fun at the expense of a French nobleman who had his left arm in a sling, having broken it a short time previously while out hunting. In front of the Frenchman were about fifty or sixty fowls, and behind him were stationed the grinning noblemen.

"Now try and count them—be quick, De B.," shouted the august personage.

"Two—four—six—eight," counted De B., when his highness threw a handful of grain into the midst of them, and of a consequence the fowls went every way trying to get at it. "Oh, dear, dear—how they do mix! Un, deux, three, four—(another handful of grain)—oh sacre! I cannot do it! They mix too mosh—far too mosh!"

Every failure of the Frenchman was hailed with a roaring laugh—few remain solemn when princes are amused. When I commenced to plant my tripod and screw on my camera, their attention was drawn towards your humble servant. The august personage threw away all the grain, and, with an eyeglass, commenced to look me over.

"Where have I seen you before?" he asked.

Old Mr. X. had given particular orders with regard to the way we were to answer if we were so honoured as to be addressed by his Highness. I am afraid I forgot his instructions when I bluntly informed his August Highness that he never had the *pleasure* of beholding my lineaments before. However, his Highness took it all in good part.

"Pleasawh—pleasawh!" he cried. "Witty dog! Haw—haw! Do you think this a good day to be photographed—eh?

This question from his August Highness flattered my vanity: he, the Prince! was actually asking Geo'. a question, actually wishing for his opinion. I consequently cast a critical eye around the horizon, and passed my opinion that it was a very fine day for our work, only a little cloudy.

"But a—but a——" and his August Highness bestowed a majestic wink upon the surrounding noblemen. "We don't want you to photograph the clouds; don't you know!"

There was such a sally of laughing at this that my mumbled answer about photographing the gods without the clouds was never heard. I must, however, compliment his August Highness, and thank him, along with the other noblemen, for their good behaviour during my exposure.

There was not a solitary movement. But they were full of mischief that morning, and when I politely requested them just to remain for a few seconds in the position I had placed them, so that another negative might be taken, and thus make sure of a good picture, I left them under the impression that they would remain so until Collona appeared with his plate. But I was mistaken. He found them all over the lawn, and had much trouble to get them together.

"De all laugh so, I do not understand!" explained Collona. But it was soon understood. Collona, as I said, after great trouble, got them in position, and at length pushed his head under the focussing cloth. In a minute he withdrew it, and, whipping out his silk handkerchief, commenced assiduously wiping the lens. Pop goes his head again, while the noble group pass winks to one another, and the Frenchman with the Lord Raglan arm kept suspiciously close to Collona, and, if anything, wore too serious a face.

"I cannot understand," cried Collona, as he again applied his handkerchief to the lens. "Dere most be too mosh nitrogen in de atmosphere."

A regular yell from the august personage and the noblemen completed Collona's confusion; when Mr. X., finding that my negative was really a first-class one, hurried down and informed them of it, at the same time signing to the amazed and scientific Collona to join me in the summer-house.

An apprentice next morning showed me a piece of thick brown paper stuck closely over the inside of the lens.

No wonder if Collona could not see to focus.

(*To be continued.*)

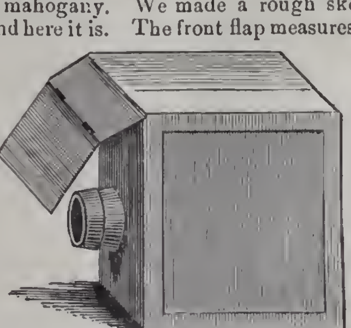
At Home.

MR. WILLIAM ENGLAND AT ST. JAMES'S SQUARE, NOTTING HILL.

When Brown saunters down the *Rue de Rhône* in Geneva with his hands thrust into the pockets of his tweed suit, proudly conscious that he has done the Swiss tour as it ought to be done, he begins to think about taking something home with him as a souvenir of his mountain trip. He has had his Alpenstock branded from top to bottom with the name of every peak and pass he has visited, so that it now represents a capital of some twenty francs, and has weighted his trunk with a mass of curious fossils and stones, which, somehow or other, appear less valuable now than when he picked them up on the mountain side; but he has, so far, purchased nothing to remind him of the snow-hooded peaks and crystalline glaciers he has seen on the "Continong." In these circumstances Brown is not long in making up his mind, and before many minutes have elapsed he is inside one of the bright stationer's shops, and putting the question, "Avey-voos un photographe de la Mare de Glass?"

Brown, of course, means to ask for a photograph, and not a photographer, but, fortunately for him, the shopkeeper understands, and in a little while a magnificent series of Swiss views are at his disposal, from which he may pick and choose. How much clearer and more delicate are the photographs than those purchaseable in England!—and they are so cheap, too. Brown makes quite a collection before he leaves the shop; they will astonish Mrs. Brown and the fellows at the club, and no mistake. It is months afterwards, when these same pictures are being examined in Brown's drawing-room, that a visitor with sharper eyes than usual points out to the travelling Briton, in a corner of the yellow mount, and in very small type, the name of William England.

Yes, Mr. William England is probably the largest Continental publisher of European views, and here at St. James's Square, or rather in a compact little establishment at the back of his residence, is the source of all the prints issued in his name. In the summer, Mr. England travels in Switzerland, the Tyrol, and Italy for months together with camera and apparatus, bringing back with him additions to his series of photographs, the names of which fill a good-sized pamphlet. Mr. England confines himself for the most part to views of small size, or, in other words, rarely goes beyond a 10 by 8 plate. His favorite travelling camera is standing in a corner, and he sets it up for our inspection; it will do for stereoscopic pictures, or for whole-plate negatives. "Here is a simple arrangement for shading the lens," says Mr. England, and he shows us what appears to be the peak of a cap made of mahogany. We made a rough sketch of this apparatus, and here it is. The front flap measures four inches



and the middle flap about three, and the double hinge arrangement permits you to bend down the peak right in front of the lens, if you like, so that you may almost employ it as a cap. But for shading the lens the arrangement is invaluable, and travelling photographers would be wise indeed to adopt so simple a modification to their apparatus. The harmony and delicacy of Mr. England's landscapes are

proverbial; the sun's glare is never permitted to exercise a baneful influence upon the middle distance and horizon, and this simple shade has much to do with Mr. England's reputation as one of the first landscape photographers.

"And this is my travelling stand," says Mr. England; "I have knocked about with it all over the Continent for eleven years, and it is as sound now as on the day it was made." It certainly is a model tripod, with two very valuable properties: it has a broad base-board, whereon to screw the camera, and it is exceedingly light. Indeed, it is wondrous strange that the material of which it is made is not more generally employed for camera stands; its whole virtue is summed up in the word bamboo. For strength and lightness the stand is simply unrivalled, and when we say that the bamboo receives a good character from a man of experience like Mr. England, there can surely be no better recommendation.

Mr. England is a man of resource. At St. James's Square he prepares his own plates, makes his own varnish, albumenizes his paper, prints and mounts his pictures, and does what lithographic or letter-press work the mounts require. Here is a model little printing establishment with two type-presses and a litho-press; and adjoining is the compositor's room, with type trays and desks complete. Both litho-press and printing-press are busily at work just now, and stacks of white and yellow mounts are standing by ready for printing. Farther on, across a spacious yard, half covered in with glass, where the printing takes place, is another building devoted downstairs to the toning and washing of prints, and upstairs to albumenizing paper and sensitizing it. The albumenizing is done when eggs are cheap, and there is very little mystery about the matter. The best Saxe paper is employed, and this is floated upon the albumen in the same way as paper is sensitized. White of egg to the extent of a few gallons is worked vigorously by a revolving whisk, and the salting solution added at the same time. The latter is in the proportion of:—

Chloride of barium	5 grains
Chloride of ammonium	5 ,,
Albumen	1 ounce

the chloride being first dissolved in a little water. The albumen, after whisking, is permitted to stand three days, and after being filtered through flannel is ready for use. Mr. England does not have recourse to hot plate pressing, or any other similar process.

The sensitising takes place on a fifty-grain bath, a three-minute glass, or egg-boiler, being methodically used to control the time. Mr. England prefers to dry his paper by artificial warmth, rather than spontaneously, and employs for the purpose a cupboard heated by a water bath; the water bath, while it causes the paper to dry quickly, does not permit it to become horny. The water bath supplies a damper heat than the outside air. The paper shows no creases, and exhibits no tendency to blister.

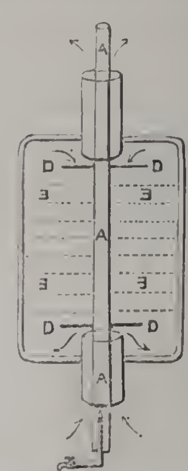
Mr. England's washing apparatus has already been described in these columns, but we may refer to it once more. In a big oblong trough is a big oblong tray; the bottom of the tray is composed of trellis-work made up of gutta-percha strips, and into this tray the prints are put. The trough contains water, and this naturally rises into the tray. The tray rests a few inches from the bottom of the trough, being pivoted in the middle at each end, so that it rocks on the slightest provocation. A little-water wheel at one side furnishes this provocation. A tap of water is running, and gradually fills up the buckets of the water-wheel, and whenever they are full, the water-wheel makes one revolution; in doing this, it lifts an arm attached to one side of the rocking tray, and the tray is thus lifted bodily on one side, causing the prints therein to be considerably agitated. Thus the prints lying in the water are vigorously shaken up every time the wheel goes round, and this may be made to revolve automatically once a minute or once an hour according as the tap of water runs fast or slow. The washing trough is, moreover, provided with a syphon arrangement for changing the washing water.

A very practical cutting-board, for cutting paper, is to be seen in the same building, which is no more than a block of beech; the grain of the wood being end on, it presents a most durable and perfect medium for cutting upon.

Mr. England stores some of his negatives—of which there are hundreds of thousands at St. James's Square—in ordinary rack boxes, and some braced together (with a sheet of blotting-paper between) by elastic web bands. If a negative is coated with proper varnish, there is no fear of the film rising, is Mr. England's opinion, and this is the way he makes his varnish. A pound of the best seed lac is put into a quart bottle of methylated spirit; the lac is shaken up from time to time, but the solution is not heated. After two or thee days, the spirit will have taken as much lac as is necessary, and the clear liquid is poured of. The residue may either be thrown away, or employed again with fresh lac.

For mounting, Mr. England employs only gum—the very best white gum—of which solutions are freshly prepared. Mounts have given him a great deal of trouble, and now he tests for antichlor or hyposulphite before he trusts to new cards; he has a liking for enamelled boards. His stock of prints, which is obviously very extensive, is kept, however, in an unmounted condition. A large staff of girls find employment in these mounting and finishing rooms.

As our readers are aware, Mr. England is *facile princeps* in the preparation and manipulation of gelatine plates. His method of emulsification has already appeared in these columns, but a brief description of a drying cupboard he employs will be read with interest. An elaborate drawing of this cupboard is, we believe, shortly to appear in print, so we confine ourselves at present to a rough sketch of it in



A, is an inch iron tube, kept hot by gas jet, C; B, is an outer tube two or three inches in diameter; D, are diaphrams to prevent light from entering above or below through outer tube; E, E, are wires upon which the plates rest; the arrows indicate the air currents.

section. An inch iron tube runs right through the centre of the cupboard, heated by means of a tiny bead-like jet of gas. A larger tube encloses this inner tube on entering and leaving the cupboard, and the warm air, which is provided with ingress and egress through the larger tube, passes over the gelatine plates, which rest in a horizontal position on wires stretched across the cupboard.

As gelatine runs at a temperature of about 90° Fahr., it is necessary that the air of the drying cupboard should average between 60° and 80° Fahr., and this is easily maintained in Mr. England's clever arrangement.

Mr. England is confident as to the great future for gelatine, and has secured most perfect results with films many months old. His formula for intensifying is that suggested

y Captain Abney, the plates, after a thorough washing, being reated with—

Mercuric chloride ...	...	... 20 grains
Ammonium chloride	...	... 20 „
Water	...	... 1 ounce

second washing follows, and then treatment with dilute mmonia.

We have no time to speak of the high excellence and harm of Mr. England's work, of his delightful pictures of taly and Switzerland, and not less pleasing reproductions f sculpture—a branch of the art in which he has recently ecome so famous. To this subject we must recur at a uture time, when we have more leisure and space at our disosal, and briefly thank our host for permitting us to impart to our readers the many valuable hints he has given us

The next "At Home" will be "Captain Abney, at the South Kensington Museum."

ARTISTIC PHOTOGRAPHY.

BY JOHN MATTHEWS.

The power of taking photographs is often put into the hands of persons to whom any effort towards elevating their proession is dormant, and to whom the sole inducement is to get as much money out of it as possible. The patronage which falls to the lot of such operators must always be much restricted; there is something more to be thought of besides pecuniary advancement, and that something is the surpassing of all previous efforts. This applies particularly to photography, for in it the results are so constantly being seen. Let it not be understood that I object to a man making money out of his profession; quite the contrary, for doing artistic work really means swelling the operator's income. Artistic photography requires a little more than common industry, it is true; there must be something learnt, something studied, but in a beautiful and engaging pursuit like photography, this labour is far from disagreeable. The above heading means a great deal more than a clean, evenly developed plate; it means lighting and posing in perfection. The man who sets up as a photographer should aim at being an artist. There are men engaged in photography who are continually aiming higher than their previous efforts—both amateur and professional—and they are examples to be imitated. Where a portrait painter shows himself superior to a photographer is in the education he receives, his knowledge of drawing, and the advantages which are offered to him of studying the finest works of the old masters—the manner, according to the rules of art, by which they produced their effects. This education very few who practise photography possess—none, I should say, who live by it—some, indeed, think such an education useless, that it would be so much time thrown away; but let a person with the qualities mentioned, take up the art-science (I fear a very unlikely probability), and the success which would fall to his lot would show how much the doubters had been deceived. There is nothing that would raise photography as a profession so much as giving its professors an art-education. However, without this there is still much that can be done. In one of Dion Boucicault's dramatizations called the "Octoroon," in which a camera is introduced, one of the characters exclaims, "The camera can't lie, Jacob!" This is a very popular fallacy—that the object which the sensitized plate is brought to bear upon will be represented exactly as the eye views it. Now, it may sound very much like a paradox, but the very truthfulness of photography contributes to its deceptive powers.

Many appearances are to be found on the sensitized plate which to the eye, when gazing on the subject to be photographed, are perfectly invisible. It does not follow from this that either the eye or the sensitized plate is the truer, but rather that their impressions of the subject materially differ. Thus, when we have photographed a human being, and the subject is deeply tanned and has prominent features which cast deep shadows, and we have no artistic skill to light that subject, and still less to retouch the negative when finished, the print that is done from it will differ greatly from the picture of the subject formed by the eye. It is also well known that with many persons their profile view is so inharmonious with a full-face view of them, that a photograph of them side face would not be recognized, at times, even by their own relatives. Yet this is not so noticeable to the eye when the operator is engaged photographing them, and for the reason that the eye, bearing on more than one portion of the countenance at once, connects each portion so together that the incongruity is lost sight of. Not so, however, with the sensitive plate: that being engaged in faithfully delineating only, the incongruous part takes no notice of any extenuating circumstances, and proves by its fidelity that its very truthfulness makes it a deceiver to the eye. These are only two instances out of many. Without artistic knowledge to correct its blemishes, photography is not truthful. Can anything more be needed to urge photographers to cultivate artistic photography? Though the eye at times differs thus from the sensitive plate, with a knowledge of the difficulties before him, the operator can remedy them. Lighting is one of the first powers dealing with artistic portraiture that an operator should become acquainted with. It is one of the most powerful aids to him in producing good and truthful work. I urge young operators, and those dark-room assistants who aspire to be operators, to become acquainted with it, for without a knowledge of lighting they need never hope to rise in their profession. In a capital paper in a late number of the News, Mr. H. P. Robinson says: "It used to be an axiom with some photographers that if there was a spot of high light on the forehead and down the nose, the lighting was right, and every other quality was sacrificed to this curious notion. Now anything is permitted, and, if well done, admired, however it is lighted, a remark which has my full concurrence." Of course, it does not follow that the lighting mentioned is an incorrect method; in my opinion, an operator should try no other form until he has mastered that.

Next comes posing: to effectually pose a subject, there must be a harmonious rendering of all the parts of the body. Straight lines as formed by the sitter when sitting carelessly should be avoided; the lines should be rounded, and contrast with other lines formed by the accessories, which last lines should agree with each other. There can still be a boldness about the posing; one or two artistic innovations introduced contribute frequently to the success of posing. Nor must a subject be unnaturally cramped; to gain an artistic position, there must be a naturalness about the arrangement, or the subject loses its force. There are apparently two ideas of posing greatly in vogue, the operator's and the sitter's: the operator's is "stiffness," the sitter's "ease." The sitter knows what he wants, but not the way to get it; the operator, the way to get it, but not what is required.

Next to these two great aids to artistic portraiture, comes that which gives a photograph one of its greatest charms—expression: it should be animated and characteristic. Any hints about expression would be of little use, for almost every operator will produce this effect according to a method of his own.

Spence's Metal.—Some weeks ago we called attention in these columns to a compound which has received the name of Spence's metal. Mr. Warnerke has recently been making experiments with this new material, and on Wednesday night communicated the results of his investigation to the members of the Photographic Club. He thinks the compound has a great future before it in photography. It fuses easily at 300° Fahr., and when cold, presents a hard crystalline surface. A Woodbury relief of gelatine, hardened in chrome alum, if used as a mould, gives a casting of exquisite delicacy, and a cast may also be taken with the "metal" from moist gelatine. Its cost is nominal—but fifteen shillings per cwt.—and it is obtainable from Berger Spence and Co., Lombard Street.

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THE DEVELOPMENT OF GELATINE PLATES.

The days of ammonia development are numbered. As the wet collodion plate has been elbowed from the front rank by the dry gelatine film, so ammonia must give place to the ferrous oxalate developer. There is no question about it. The fact must be patent to all who have followed with interest the progress of the new era. Photographers there will be, who may still cling to ammonia, and hope by employing solutions of considerable strength, and by having recourse now and then to intensifying, to hold their own; but they will be left behind in the race by those who have recourse to the more modern, more pleasant, and, we must add, simpler plan of development.

There is always a disposition to cling to what is old, and as ammonia development has been generally practised for the past ten years, it is only natural that an effort should be necessary to part with it; putting aside the early acquaintance of oxalate by the fathers of photography, we may take it that the latter has only come into use since the days of gelatine, but now it is to the fore, it is never likely to lose its position as a favourite.

There is an idea that oxalate development is complicated, and that the developer itself is difficult to make. This, we may state at the outset, is mere prejudice and nothing more; and, when we add that there are no unpleasant fumes—ammonia is very unpleasant in a small confined place—that the development is effected much more quickly, and that, moreover, the result is far more apparent to the worker, than in the case of ammonia solutions, we think we have said enough to establish our enthusiastic opinion of the newer developer.

We have tried several oxalate developers, and pronounce emphatically in favour of that proposed by Dr. Eder, a name already sufficiently well known to command the respect of photographers. This developer has given the most satisfactory and uniform results, and it is very easy of production. You have simply to dissolve two salts, and mix these solutions together. Dr. Eder's formula is as follows:—

Solution A.

Neutral oxalate of potash ...	260 grammes
Water	1000 „

Solution B.

Sulphate of iron	100 grammes
Water	300 „
Sulphuric acid	2 to 4 drops

Multiply by 15½ to bring grammes into grains.

The two solutions, *A* and *B*, are kept in stock, and when required for development, three volumes of *A* are mixed with one volume of *B*.

A more simple developer can scarcely be imagined, and considerable experience of its action permits us to speak of it in the highest terms. The sulphuric acid specified is not sufficient to render the developer acid, but in experimenting we have worked with a perfectly neutral developer, and without materially affecting the result. In these circumstances we hardly think that the term alkaline development is applicable any longer to this treatment.

The negatives approach very much in appearance those from wet plates; there is an absence of all brownness, and we have never had occasion to intensify. Again, the sensitiveness of the plates is greatly improved, as will be seen at the first comparative experiment made with the ammonia and oxalate developer. To push the test of sensitiveness, we made the following delicate experiment. A series of luminous paints applied to a deal board were exposed to sunlight, and then brought into the dark room. They all presented the well-known violet phosphorescence of a more or less vivid character. A gelatine plate was exposed for a period of ten minutes in a stereoscopic camera (lenses Dallmeyer's No. 1B), and the plate being subsequently cut in two with a diamond, half was put into a strong ammonia and pyrogallic bath (with freshly-prepared pyrogallic solution), and the other into Eder's oxalate developer. Before five minutes had elapsed, the Eder plate showed a perceptible picture, but a quarter of an hour's sojourn in the ammonia bath failed to give but the faintest image.

Finally the oxalate developer, while you can see the result so much better, is more accommodating in its action. A stereoscopic plate was exposed for two seconds in the studio and cut into halves; one-half was permitted to remain in the bath for five minutes, and the other for half-an-hour. The first was the better negative of the two, but in the second there was not the *least trace of fog*, neither had the soft gradations been spoilt; the only difference was that the latter plate was very dense, and required a good deal of printing.

We may safely say that any of our readers who try a good oxalate developer, such as Dr. Eder's has proved in our hands, will never have recourse again to ammonia.

IODIDE OF SILVER IN GELATINE EMULSION.

The subject which Captain Abney brought before the Photographic Society of Great Britain on Tuesday evening is one which deserves more than a passing remark, and though the paper is not yet in our hands, we will give the salient point in it which is that on which we wish to address our readers. Captain Abney states that as sensitive a gelatine emulsion can be made with addition of iodide of silver to the usual bromide, as can be obtained with the latter salt alone; but, more than this, he states that the light in which such plates can be manipulated and the emulsion be prepared is such as is to be found in the dark-rooms of most photographers who still use the wet process, and these are not to be numbered by dozens, but by hundreds. There is something excruciating in the light required for the development of the ordinary gelatine plates: the developing cup has to be guided almost by instinct, to the dish in which the plate is immersed, and the details of the image can scarcely be discerned, the light is of such a dim religious character.

Taking Captain Abney's word for the sensitiveness of the emulsion, the necessity will no longer exist for this very trying illumination. A full flood of what we usually thought a non-actinic light may be used, and no damage will be done to the plate. Some specimens which were kindly shown us were brilliant and clean, no tendency to veil, and of a capital density; the image itself might have almost been mistaken for one produced by the wet process. We notice that in his "printing by development" he makes the remark that if a full dose of iodide of silver be present in the paper, the image is always blacker than if bromide alone be used. Such is the case, with these plates, as the olive-green or brown colour usually seen when alkaline development is employed is entirely absent. We commend the process to the attention of all interested in the matter, believing that this modification will be no slight boon to many photographers who struggle with the enemy of fog.

Notes.

"How to Prepare and Develop Gelatine Plates" is the title of a new work by Captain Abney, R.E., F.R.S., which is shortly to appear.

Mr. H. P. Robinson, of Tunbridge Wells, has forwarded us an exquisite series of cabinet portraits, the models attired in fancy dress; the pose and attitudes are fresh and engaging, while there is an absence of egotism about the portraits usually to be remarked in the faces of people who are playing a part.

Monster lenses seem to be the order of the day. The Autotype Company employ at Ealing for their enlargements a pair of condensers twenty-two inches in diameter, which weigh a hundredweight. M. Feil, of Paris, has just cast a glass disc that weighs three hundredweight and a-half, and is intended for the Pulkowa Observatory.

The Paris Observatory, which is in want of a big lens too, is to receive M. Feil's attention after he has done with the Russians, but since the latter have ordered a second and larger instrument, Paris will have to wait some time yet. The great Pulkowa flint lens, we are told, is to weigh 220 kilogrammes, or four hundredweight, and, according to *Nature*, a period of five weeks will be taken up in annealing the glass after it has been cast.

Mr. England has been employing gelatine plates almost exclusively of late in his reproductions of sculpture, and it says much for the clearness and delicacy of the gelatine film to find Mr. England eminently satisfied with his results. He calculates that the gelatine films of his own preparation are twenty times as sensitive as wet plates.

M. Rousselon, the manager of the photographic printing works of MM. Goupil et Cie, at Asnieres, seems to have made *photo-gravure* a success. It may be remembered that some years ago the French Photographic Society awarded to M. Rousselon a gold medal for his improvements in Woodburytype, and he has now so far completed the process that he is enabled to print photographs in the same way as engraved plates, and with ordinary printer's ink. He begins first of all with a Woodbury relief film, in which shadows are represented by prominences, more or less high, according to their intensity, and imparts to this gelatine a grain, which grain is coarser or finer according as the prominences are more or less marked. A metal plate receives an impression of this gelatine film, and the metal plate then resembles very much an engraving produced by the graver, in which high lights are represented by little points, and shadows by big ones. M. Rousselon prints impressions from this plate as he would from a copper-plate engraving. How a grain of the varied character in question is imparted to the gelatine mould is a secret, which M. Rousselon keeps to himself; but both Mr. Woodbury and Mr. Swan, we may mention, have worked in the same direction, and with some success.

A novel piece of apparatus was brought to the attention of the members of the Photographic Club the other night, described as working without stops, capable of taking the views of all members, and with a result that might be either positive or negative. It was a new ballot box.

Mr. W. G. Tweedie has called attention once more to the assistance which the camera can afford in surveying. In a lecture at the *Plymouth Athenæum*, he explained his mode of proceeding; this was to have a camera by means of which a cylindrical projection of the objects is taken on a flat plate. Two such photographs, taken from the extremities of a measured base-line, will, Mr. Tweedie declares, supply all the necessary data for making a map of the whole country in front. From these two photographs, by means of two scales of simple construction, the surveyor's work, hitherto done in the field, will be equally well performed in the office; and, by the use of dry plates, the operator is relieved from all chemical operations in the field.

The plane-table of M. Chevallier will be remembered as an instrument in which photography was made to do the work of prospecting. The late Emperor of the French took up this invention very heartily, and by its means M. Chevallier hoped to be able to direct artillery fire as well by night as by day. Unfortunately, M. Chevallier's death intervened, and the *planchette photographique* was never perfected altogether.

At Strasburg much work was done with the camera in military surveying by the Germans during the time of the siege. The War Office in this country, through Mr. Baden Pritchard, has also taken up the matter of making surveys of an enemy's position at a distance, the negatives secured being afterwards enlarged to suit various practical applications.

We are, it seems, to have the electric light for another year on the Victoria Embankment, where it has already shone for the past fifteen months. There is, however, no need for us to congratulate ourselves upon being in the van of civilisation in this respect, for the Shah of Persia has a mansion at Teheran illuminated by electricity; while that somewhat erratic monarch, king Thebau, now lights up his Palace at Mandalay with no less than sixty of the Jablochkoff electric candles.

An eminent West End firm we wot of, takes the precaution of sending out all proofs untoned. The system has a double advantage: in the first place, the sitter gets his proofs the same evening; and secondly, if the photographer has not been paid, he, at any rate, has the consolation of knowing that he has not been taken in very much.

How to make a paste or cementing material that is proof against acid fumes—like those given off in the preparation of silver nitrate, for instance—is well worth knowing. Finely powdered glass mixed with soluble silicate of soda will give a material of this description.

Dr. Tyndall has delivered the first of a course of six lectures on "Light as a Mode of Motion," at the Royal Institution.

Photography is made use of in the production of the tiny sketches that illustrate most of the theatrical programmes of the day. The characteristic sketches in question, in which the portraits are often exceedingly fine and vivid, are drawn first of all in black and white some two feet high, and then reduced by the aid of the camera. The result is lines of a very delicate character. The process is one of the most successful of those in which photography plays a part.

Talking of photography in connection with the drama, it may be noted that Mr. George Grossmith, the well-known comedian and creator of the rôle of Sir Joseph Porter in the "Pinafore," is an accomplished amateur. We possess several examples of his work.

Some experiments recently made with coloured lights for railway signalling call to mind a series of practical trials conducted at Genoa some years ago. A row of coloured lanterns was set up on the shore, and a boat filled by half-a-dozen observers was gradually pulled out to sea. White light was seen at the longest distance, then red, and then green; but the green, before it actually disappeared, began to look like a white light. Consequently, our railway companies can hardly improve their choice of white, red, and green signals.

Where there is no gas supply, and the Bunsen burner cannot, therefore, be employed for heating purposes, Dr. Vogel recommends the use of the hydrogen flame in place of the spirit lamp. The hydrogen can be produced in the ordinary way from the action of dilute sulphuric acid on zinc, but the apparatus must be arranged for giving a constant supply of the gas, and must be provided with a cock by which the pressure can be regulated. The gas must not, however, be burned at the mouth of a glass tube, as the glass is liable to decomposition by the heat of the flame; for a burner the extremity of a blowpipe tube without the platinum point should be used.

Photographers should be careful to whom they supply unmounted prints. Mr. William England tells us that on a recent occasion a dealer on the Continent asked to be furnished with prints and cards separate, and upon the latter, which bore Mr. England's name, he mounted pictures of another photographer.

The discovery came about in a very singular manner. On a visit once to Cyfarthfa Castle, Mr. England was asked by one of the late Mr. Crawshay's sons how he managed to reach the Gross Glockner glaciers with his camera. "Never was there," was Mr. England's reply. "Yes, you were, and I can prove it, for I purchased a photograph of the glacier, taken by yourself." But on production it was found that not the photograph, but the mount, had emanated from Mr. England.

Topics of the Day.

BROWN MOUNTING CARDS CHEMICALLY CONSIDERED.

BY JOHN SPILLER, F.C.S.

The experiments which I made, and recorded in the News twelve years ago, "On the Occurrence of Hyposulphites in Mounting Cards," have assumed a fresh interest in connexion with Mr. Marshall Wane's "Remarks on Washing Prints," communicated last month to the Edinburgh Photographic Society, and the whole subject is allowed to be of so much importance that I need no apology for returning to its consideration at the present time. I am further encouraged to take up the matter by the receipt of some brown mounting cards kindly sent to me for examination by the Editor of this journal.

These have been experimented upon, and compared with such mounting cards as I could procure at short notice, in order to test the degree of perfection of recent manufactures, and judge of the amount of reliance that can be placed in the permanence of photographs mounted on cards now offering in the market.

The method of inquiry was to ascertain, in the first instance, the presence or absence of hyposulphite (antichlore) by following the system pointed out in my former paper, viz., by immersing slips of the card in equal measures of distilled water to dissolve out the impurities, and then testing the aqueous solutions with very weak iodine and dextrine (or starch), judging of the proportion of hyposulphite, if present, by the rate of bleaching, or amount of iodo-dextrine decolourised. Proceeding in this manner, I tested the brown mounting cards against six other varieties of ordinary make, which may be thus described:—

No.			Grains.
1.	Plain white C.D.V. card ...	weighing	58
2.	Superior enamelled white card with red marginal lines... ...	,,	60
3.	Pale buff card with oval design	,,	65
4.	Neutral tint card, "Ch.D. deposé," oval design, embellished with bronze paint	,,	63
5.	Ditto, ditto, of darker neutral tint	,,	58
6.	Ditto, neutral tint, double oval	,,	68
7.	Brown card, heavily pigmented on both sides, with rounded corners and chocolate lines ...	,,	82

Other cards of this last description, also furnished by the Editor, weighed respectively 80 and 82 grains. They are, therefore, much heavier, without apparently being any stouter, than the rest, the thick coat of ochrey paint accounting for the increased weight.

The cartes were cut into slips longitudinally, for convenience of inserting them into test-tubes, and one ounce measure of hot distilled water was poured upon each card, and left in contact for several hours. A standard solution of iodo-dextrine was then prepared by dissolving one grain of iodine in three grains of potassium iodide with the help of a little water, and then adding one pint of a cold solution of dextrine containing twenty grains of that substance. The solution was then of a claret or plum colour, and it is important to note that, although hot water is best employed for dissolving the dextrine, the liquid must be allowed to become again quite cold before adding the iodine, inasmuch as the iodo-dextrine, like the corresponding blue iodide of starch, is decolourised by heat, and fallacious results would be obtained were this precaution neglected. A standard solution being thus procured, it was filled into a graduated burette or dropping-tube, and delivered in measured quantities, into each of the test-tubes, after the cards had been removed. The relative degrees of bleaching could then be observed and compared, and the amount of hyposulphite in each case inferred from the quantity of iodo-dextrine employed to produce a permanent tint.

Proceeding in this way, it was easy to arrange the cards in order of purity, and find out at once those best fitted for use in the mounting room. Out of the seven cards examined, No. 1 proved to be the worst of the series, for in this case the pure white tint was evidently got by the employment of highly-bleached paper-stuff, whereas the enamelled card, No. 2, owed its whiteness to the fact of a thin, uniform coat of sulphate of baryta being applied to the face of the mount, the substratum being of inferior colour, and probably never bleached in the pulp state. At all events, this card contained a mere trace, if any, of hyposulphite, the quantity of iododextrine solution required to impart a permanent tint being only four measures, against three required for pure water; whereas the cheap white card, No. 1, took as much as thirteen measures to communicate a permanent tint to the solution.

All the rest took three and four measures respectively, including the brown card, which cannot, therefore, be condemned as containing hyposulphite. Upon taking the layers apart, after soaking in water, I found here, also, the substratum to be quite satisfactory; probably never bleached with chlorine, and consequently not requiring an antichlore. I then examined the yellow colouring matter, which is laid on back and front of the card in the form of a thick coating worked to a highly-glazed surface. The pigment cannot well be scraped off, nor is it soluble in warm alcohol. Immersed in water it soon drops off the card as a heavy ochrey deposit, and this was carefully examined. I find it to be a mixture of sulphate of baryta and basic sulphate of peroxide of iron, and the prejudicial action upon the photograph, if really exerted, must be due to the last-named substance, which, it will be remembered, is the ochrey deposit that forms in solutions of sulphate of iron exposed to the air. I have no knowledge of any experiments showing the action of this body upon silver prints, and cannot predict what will be the effect of long contact. This point, if not already ascertained, is well worth investigation.

Mention is made by Mr. Marshall Wane of his having a stock of some two thousand cabinet mounts "hidden away in the dim regions of a Manx attic," which he never intends to use. Without mentioning names, I know of two or three other eminent photographers who, at various times, have met with similar experiences, and it was upon the representation of one of these gentlemen that I first took up the subject, and condemned a lot of yellow mounting cards in the year 1868.

Ultramarine—a sulphur compound—is another pigment which should never be allowed to become mixed in the pulp from which mounting boards or cards for photographic use are intended to be made. Its detection is extremely easy, for one has only to burn the cards, and look for the blue particles in the residual ash. It is never destroyed by burning, being itself the product of a furnace operation. Large quantities of ultramarine are known to be employed in the manufacture of blue-wove papers, and in some kinds of cardboard. Of course, it will be understood that this objection applies only to such as are intended for the mounting of silver prints, for in the case of carbon prints and platinotypes no fear of injury from this source need be entertained.

The use of the copper, zinc, and tin alloys known as "gold and silver bronzes," for embellishing photographic mounts, has already been shown to be very prejudicial. I have frequently seen photographs peppered all over with spots of decomposition, attributable to this cause; and, inasmuch as these metallic particles are often very loosely adherent, it is not wise even to use the bronzes for printing the name and address on the back of the mounting cards, as was formerly a frequent practice.

The Topic for next week will be "The Chemistry of the Gelatine Process," by Dr. H. W. Vogel, of Berlin.

THE PREPARATION OF GELATINE EMULSION WITH AMMONIA.

Herr E. von Schlicht, an amateur of Berlin, has been trying the addition of ammonia to gelatine emulsion, as recommended by Van Monckhoven, and gives in the *Photographische Mittheilungen* an account of his experiments, of which we append a short abstract.

He used the formula for the emulsion which Professor Vogel has published, viz.:—1 gramme of white German gelatine; 1 gramme of dry ammonium bromide, dissolved in 20 grammes distilled water; 1·7 grammes of crystallized silver nitrate, dissolved in 10 grammes distilled water. To this he added precisely the quantity of ammonia prescribed by Van Monckhoven; but as this quantity must depend on the strength of the solution, he first determined the specific gravity of the latter. Adopting this method it was found necessary to take 1·5 grammes of ammonia solution of ·963 specific gravity.

The mixture was kept warm for twenty-four hours, and then, as no constant water supply was at hand, it was washed in alcohol. When fresh alcohol had been three times poured over the mixture, all the soluble salts were drawn out of it, together with the water. He had prepared double the quantity of emulsion given in the above formula, and after pouring off the last drop of alcohol, the mass weighed 25·4 grammes, showing that it still retained 18 grammes of alcohol. It was then dissolved in 56 grammes of water, and the plates were coated in the usual way; in consequence of the emulsion containing so large a proportion of alcohol, the plates, after standing in the drying-box on a warm stove for twelve hours, became perfectly dry.

The plates proved to be about one-third more sensitive than those coated with emulsion which contained no ammonia, and which had been kept warm for five days; their intensity was exactly the same as that of emulsion plates without ammonia. Most peculiar was the green tint very perceptible in the depth of these plates, when viewed by reflected light against a dark background—a pheuomenon which is not observable in plates prepared without ammonia.

The greatest difference, however, between these plates prepared by the new method, and the old ones bought from the manufacturers, consists in the ease with which they can be softened preparatory to using the developer. The former, Herr Von Schlicht was compelled to leave to soak for a considerable time in spring water; the latter were softened in the short space of time required for mixing the developer. Reasoning on this peculiarity, Herr Von Schlicht believes that he has found the cause of the special action of the ammonia. He attributes it to the diffusive action of the ammonia on the gelatine, enabling the developer to penetrate with greater ease. This diffusion was probably effected under the old system by the lengthened emulsification. A contrary effect may be obtained by treating the film with alum before developing, that is, by rendering it denser; in this case the image only appears after long-continued development, and can be seen on the surface by reflected light.

AN IMPROVED METHOD OF ALKALINE DEVELOPMENT FOR GELATINE PLATES.

BY B. J. EDWARDS.*

Notwithstanding all that has been written from time to time on the subject of alkaline development, I make no apology for again introducing the subject to your notice this evening in connection with gelatine plates, the latest and most important improvement in photography. Development by alkaline pyrogallic has always been a favourite method of working, owing to the great latitude in exposure allowed by its use, and to the fact that it affords almost

* Read before the South London Photographic Society.

complete control over the density and detail of the finished negative; there are, however, certain disadvantages connected with this mode of developing as usually practised, owing chiefly to the rapid deterioration of the developing solutions when mixed ready for use. It is well known that an acid solution of pyrogallic will keep and retain its properties for a very long time; but when an alkali is used in place of the acid, in a few minutes the mixture becomes decomposed and utterly useless. Even a solution of plain pyrogallic in water will only keep a very short time, and begins to deteriorate from the moment it is mixed. For these reasons it has, I believe, now become the general custom to make the developing solution by adding a small quantity of dry pyrogallic acid to the quantity of water required for the development of each separate plate, which is better than the old plan of using dropping bottles or tubes; but there are grave objections besides the inconvenience of measuring small quantities of dry pyrogallic; in the first place, small particles of this light feathery substance are very apt to blow about the dark room, and would in time doubtless accumulate in odd corners and cause trouble in various ways; secondly, and more important, it is practically impossible to guess the exact quantity required for each plate so as to keep the developer at a uniform standard strength; consequently, as the density of the negative depends to a great extent upon the quantity of pyrogallic in proportion to the other ingredients, it becomes exceedingly difficult to obtain negatives of anything like uniform printing density.

To obviate this difficulty it has been proposed—first, I think, by Mr. Swan—to make separate standard solutions of ammonia and bromide and pyrogallic in water of the strength required for use, and to mix equal parts of these two solutions just before developing the plate. This plan I think far preferable to the others I have mentioned, if we can only keep the solutions always in their best condition, and always ready for use. Both these conditions are fulfilled by the methods I have now to describe, and which I have used for the last six months in daily practice in the studio.

Make two stock solutions, and label them No. 1 and No. 2.

No. 1.

Pyrogallic acid	1 ounce
Glycerine	1 ,,
Methylated alcohol	6 ounces

Mix the glycerine and spirit, and add to the pyro.

No. 2.

Bromide of potassium (or ammonium)	60 grains
Liquor ammonia ·880	1 ounce
Glycerine	1 ounce
Water	6 ounces

The above stock solutions will keep any length of time.

To make the developer, add one part of No. 1 to fifteen parts of water, and label this bottle D (developer); in another bottle mix one ounce of No. 2 with fifteen ounces of water, and label A (accelerator).

It will be found convenient, to avoid mistakes in the imperfect light of the dark room, to have these two bottles of different shapes. Either of the above solutions will keep two or three days. When required for use, pour into a clean glass measure equal parts of D and A, adding the A last just before using. Place the dry exposed plate face up in a shallow dish or tray, and pour the mixture steadily over the plate, avoiding air-bubbles; should any adhere to the surface of the plate, at once remove them with the finger or a camel's-hair brush kept for the purpose; rock the dish gently, taking care to keep the plate well covered with the solution; in a few seconds the image will appear, and if the exposure has been well timed, all the details will be out, and the development complete in about one minute, when the negative should be well washed under the tap and placed at once in the fixing bath.

Do not hurry the development, but allow the plate to remain in the solution after all the details are visible, until the required density is obtained. With this developer used in the above proportions, there is no danger of fog, except from the action of light.

If, on the application of the mixed developer, the image flashes out, and the details in the shadows appear too quickly, it will indicate that the plate has been over-exposed, therefore at once throw off the mixed developer, and, without stopping to wash the plate, flood it with D alone, when the development will be checked, and will proceed more slowly, while the image gains in density; if too slowly, or the negative appears to be getting too intense, add a very little A. There will, however, usually be sufficient of the latter left on the plate to complete the development with the simple addition of a sufficient quantity of solution D. A very little experience will enable the operator to produce a good printing negative from a plate which, if developed with the full proportion of A, would have been utterly useless from over-exposure. (In very warm, bright weather, it will, perhaps, be found an advantage to use rather more D than L in the mixed developer, giving just sufficient exposure to avoid hardness in the negative.) Under-exposure can be corrected to a great extent by increasing the proportions of A in the mixed developer, but the addition should be made at once, before the development has proceeded too far, or the effect will be to increase the density and cause too much contrast in the negative.

The proportions of the mixed developer can be varied at will by the operator according to the character of the results he wishes to produce. The proportions given above are suited to my own plates, and some others I have tried, but probably would not suit all kinds of plates without some modification of the stock solution, such as the addition of a greater quantity of the restraining bromide in the No. 2 solution.

These concentrated stock solutions will be found very convenient to use, and a great saving of time in weighing and measuring small quantities.

With regard to the keeping properties of the No 1. pyro solution, I have found no difficulty whatever; the glycerine seems to act as a perfect preservative. The bottle marked No. 1, which I now hand round for your inspection, was mixed last August, more than six months ago; the solution seems to have undergone no change; it is now about the same colour as the day it was mixed. That this is owing to the glycerine, and not to the alcohol, is proved by the other bottle marked No. 2, which contains no alcohol, but the same proportions of pyro and glycerine mixed with water and kept six months; this, you will observe, has become slightly discoloured, but is still in good condition.

I am satisfied of the value of glycerine (or glycerine and spirit) as a solvent and preservative of pyrogallic acid, and I have also every reason to believe that the presence of a small portion of glycerine in the developer is of great benefit; it seems to act as a restrainer, and entirely prevents fog even with a very small proportion of free bromide; in fact, with some plates I have found no difficulty in dispensing with the bromide altogether. I also find, when using this developer, that I have far greater control over the density of the finished negative, as the developer never fogs. It is only necessary to allow it to remain on the plate until the required density is obtained, thus obviating the necessity for after-intensification. Since adopting this method I have had no occasion to intensify any of my negatives.

I have brought with me two or three negatives for your inspection; they have all received different exposures, two on each plate, and, although developed with the glycerine developer in the usual way without special care, you will find that in every instnace the densest negative is that which has received the longest exposure. This effect may

possibly be, to some extent, peculiar to my own plates, as I have not made comparative trials with plates of other makers; in any case I am glad to avoid the trouble and risk of intensification, for which I no longer find any necessity.

I have also brought a small bottle of the dilute pyrogallic solution, which has been mixed two days; it is still in good working order, so that it can always be used to the last drop, and need not be wasted.

In conclusion, I trust that the modification I have described will be as successful in the hands of others as it has proved in mine.

Proceedings of Societies.

Photographic Society of Great Britain.

The monthly meeting of the Photographic Society was held on Tuesday, at 5a, Pall Mall East, the President, James Glaisher, Esq., in the chair.

Mr. J. H. Dallmeyer read a paper "On the Optics involved in the Construction of the Magic Lantern; and on a New Lens or Objective," two specimens of which were exhibited. Mr. Dallmeyer, in the course of his paper, said that he had been first led to turn his attention to lantern lenses by Mr. Latimer Clarke, and afterwards by the Rev. F. Hardwich, who had written to him a number of letters on the subject of a most exhaustive character. Mr. Dallmeyer then, after pointing out the three principal points in a lantern lens—namely, the source of light, the condenser, and the lens—went on to describe the various lantern lenses in use, and their shortcomings, and proceeded to detail the peculiarities of the lens which he had designed to remedy the defects referred to.

Capt. Abney inquired whether Mr. Dallmeyer held out any hope of the production of a lens which should do equally well for photographic as for lantern purposes.

Mr. Dallmeyer said that if there was sufficient demand for such lenses, he believed they could be produced. It must be borne in mind, however, that a photographic lens corrected for actinic rays did not admit of so much negative power, hence flatness of field had to be corrected.

Mr. York corroborated the statement of Mr. Dallmeyer as to the excellent working quality of his new lenses. He had had letters from the Rev. Mr. Hardwich, in which that gentleman had said that the new lens was all that could be desired. Formerly, he (Mr. York) had supplied Mr. Hardwich with only uncoloured slides, as the ordinary commercial lens was not capable of reproducing colour truthfully; but with the new lens this difficulty was not felt.

A vote of thanks to Mr. Dallmeyer having been passed, Capt. Abney read a paper entitled "How to Work Gelatine Plates with Comfort." Capt. Abney's method was the introduction of a bromo-iodide of silver into the emulsion instead of a bromide alone. By this means the ordinary orange glass could be used, while he did not notice any loss of sensitiveness. Capt. Abney incidentally mentioned that he believed he had discovered a means by which gelatine negatives could be intensified with silver, and intensified locally if necessary, but at present he had not worked out the exact details.

A paper by Mr. England on a new form of drying-box for gelatine negatives was then read. The principle of the box was the heating of the air by means of a gas jet at the bottom of the box, the hot air passing out at the top by means of a ventilating tube.

Mr. W. Bedford, in commenting upon Capt. Abney's paper, said that he had tried a bromo-iodide emulsion, but had found, contrary to Capt. Abney's experience, a great loss of sensitiveness. He was not altogether sure whether the test by the spectroscope was always reliable.

After a few remarks from Mr. Warnerke in reference to emulsifying by means of his iron mill,

Mr. England said he could not agree with Mr. Bedford as to the insensitiveness of bromo-iodide emulsion. Some of his most rapid plates had been produced by this method.

Mr. Davis asked whether the precipitate of iodide of silver could be produced in a sufficiently fine state by washing in water alone.

Mr. Spiller suggested, in reference to Mr. England's drying box, that it might be an improvement if the gas jet were placed at the top of the box to induce a draught, and a supply of air, made dry by passing over chloride of calcium, introduced at the bottom.

Mr. England said he had tried the plan of the gas jet at the top, but he did not find the plates dry so rapidly. The box, as he designed it, answered admirably. The temperature kept very level, and the plates dried remarkably even.

Mr. Davis remarked that he had tried Mr. Spiller's plan of creating a current of air by means of a gas jet, but had not found it very effective.

Mr. Thompson had tried Mr. Spiller's method, and had dried the air by means of sulphuric acid; but he did not find the plates dry very quickly.

Mr. Davis said he had found heating the air with a hot water bottle covered with flannel answer very well.

Captain Abney pointed out that in drying air there was always the difficulty to be overcome from the rush of air through the crevices, generally of sufficient force to overcome the effect of the drying medium. With regard to Mr. Bedford's objection to the spectroscope, he was at a loss how to answer it. For himself, he could conceive of no better way of testing sensitiveness than by the spectrum. He might remark that he had not used orange glass in the dark room for the purpose of experimenting, as the glass in his room was ruby. He had, however, exposed negatives under orange glass, and that he took to be a sufficient test.

The President having referred to the photographs on the walls, which had been kindly contributed by Messrs. Willis (of the Platinotype Co.), Brownrigg, Payne Jennings, Cutching, and Sent, of Melbourne, said, in reference to the latter, that Mr. Sent, in writing to Mr. Payne Jennings, had asked him to exhibit the pictures at the Society's meeting, and to express his willingness to exchange prints for any good specimens of work by English photographers. The President also announced that the subject for discussion at the next meeting would be "Instantaneous Shutters," and he hoped all those members who had inventions of any kind in this direction would bring them. The proceedings then terminated.

South London Photographic Society.

The ordinary monthly meeting of this Society took place on Thursday, April 1st, in the rooms of the Society of Arts, Adelphi, Rev. F. F. Statham, M.A., President, in the chair.

The minutes of the last meeting having been read and confirmed, Mr. T. Barnes was elected a member.

The Chairman stated that the rules of the Monthly Artistic Competition had been revised by the Committee, and they would be printed and forwarded to the members as soon as possible.

Mr. W. Brooks then showed a specimen of Schering's celloidin, and stated that it made a perfectly structureless film, and no doubt would be found of great use.

Mr. B. J. Edwards then read a paper entitled, "An Improved Alkaline Developer for Gelatine Plates" (see page 177), and also exhibited some negatives developed by his method, showing that the most exposed had the greatest density.

The Chairman having remarked that nothing was so valuable as the remarks of the expert,

Mr. Warnerke stated that having tried Mr. Edwards' formula, he had found it work better than any other; he could say nothing about its keeping qualities, but it worked more energetically, and there was perfect freedom from fog.

Mr. Cowan stated that he had developed a negative over six minutes without any trace of fog appearing, the negatives looking more like wet plates; also that all the detail and required density came up in about fifteen seconds.

In reply to Mr. W. Brooks, Mr. Edwards said he used Price's glycerine.

Mr. Brooks said some time ago he had used gelatine in the developer, and had found very little yellow fog.

Mr. Bolton had found decomposed gelatine—or, rather, when it had lost its settling power—very useful as a restrainer.

Mr. Henderson asked if sugar would not act in the same way.

Mr. Edwards had found glycerine the best, though, no doubt, sugar would answer the purpose.

A general discussion ensued relating to developing an over-exposed negative.

Mr. Edwards having stated that he thought imperfect washing previous to fixing caused a great deal of the yellow fog,

Mr. Henderson took exception to Mr. Edwards' remarks, but stated that by immersing the plates in a solution of boracic acid and alum all chances of yellow fog would be removed.

Mr. Warnerke stated that there were two kinds of fog, yellow and green; these only appeared with some makers' plates, but not with others, and asked if Mr. Edwards would explain.

Mr. Edwards having stated his inability to answer,

Mr. Warnerke said he had found that the silver dissolved in gelatine, and the bromide also dissolved in gelatine, produced the highest state of green fog.

Mr. W. Brooks said that when a negative was found to be over-exposed, the best way was to drop it into a dish of ale, and mix fresh suitable developer.

Mr. C. Poirson asked if the glycerine had any effect upon the drying of the negatives.

Mr. Edwards said, not at all, as it was easily washed away.

The discussion again assumed a general character.

Mr. F. Howard thought that by the addition of sulphate of iron to the hyposulphite, all traces of yellow fog would be removed.

Mr. Payne Jennings asked if that would increase the density.

Mr. Howard said that the shadows being clearer, so much density would not be required.

A hearty vote of thanks was then passed to Mr. Edwards.

The Chairman announced "An Election" as the subject for the May monthly competition.

After Mr. Cocking had promised a paper for May, the meeting adjourned.

Glasgow Photographic Association.

A meeting of this Society was held in the Religious Institution Rooms, Buchanan Street, on Thursday evening, March 25th, Mr. Urie in the chair.

The minutes of the previous meeting were read and approved of.

The Treasurer (Mr. Bell) showed three dry plates which were varnished; when printing from them they unfortunately got wet, causing indelible stains. Although the varnish was dissolved off, the stains still remained in the film. Mr. Bell asked those present the best plan to obviate this defect, and was recommended to coat the plate with onamel collodion prior to varnishing.

Mr. H. Read exhibited a new form of lantern for the dark-room, adapted for gas; also a convenient form of bottle, covered with india-rubber cloth, for washing emulsion.

A light portable dry plate camera for stereo or 8 by 5 plates with double dark slides, partly made of ebonite, was sent by Dr. Bell for inspection.

The Secretary (Mr. Mc'Ghie) also showed a new camera he had had made by Messrs. George Mason and Co., being very portable, and on the "Universal" principle, with a swing back of a simple, but very effective plan. It is suited for whole plates and the other sizes smaller, fitted with double dark slides, and suited for either wet or dry plate work. The camera was much admired by those present.

Mr. H. Reid, Dr. Bell, and the Secretary were awarded a hearty vote of thanks for their trouble in bringing these apparatus before the members of the Society.

A vote of thanks to the Chairman brought the meeting to a close.

To Correspondents.

*** Mr. Chilton's paper will be concluded next week.

Erratum.—In our leader of last week, by a printer's error, Mr. Kennett was credited with introducing prolonged emulsification. It was, of course, Mr. Bennett, who recommended and practically carried out this modification.

Debutante.—We do not think that the American jurors made any distinction in their awards; but each award was accompained by the reasons of the award. We cannot answer your second query; perhaps the Messrs. Anthony and Co., of New York could tell you.

Inventor.—You are confounding the names; they are nephew and uncle. Nicephore Niepce was the first camera photographer, and Niepce de Saint Victor, his nephew, the first to apply sensitised albumen upon glass for negatives.

Dry Plate Worker.—The ammonia is certainly slow; if you have not tried the oxalate developer, do so; you will find it quicker.

Little Photo.—Your paper has not been in contact with the negative, hence the blur.

Amateur.—No 1. Certainly, write to the Platinotype Company. No. 2. The Autotype Company are still interested in Lambertype, but they will, no doubt, tell you what you want to know.

Boarding School.—You mean bichromate of potash. Make a solution (five per cent.) and brush it upon ordinary writing paper. Dry in the dark. A fern leaf or other object put on the paper in the sun will print off its image; wash in water, and the image is fixed.

Carbon.—The prints contain very little silver, and it would not be worth while burning them to recover the metal.

Puzzled.—See Mr. Edwards's paper this week; it will probably give you all the information you want.

E. H. M.—We shall have a "Topic" on the subject shortly, which will give the process in detail. Shortly Mr. Valentine Blanchard will communicate an article on the silver bath, which will, no doubt, satisfy you in this respect.

Nemo.—Our "At Home" this week answers your question.

B. B. B.—The iron process of M. Poitevin gives very fine black lines or stipple; you will find it described in the News of the 24th January. We have practical experience of its value.

Pyro.—Ground glass is a capital thing for studios; in fact, Messrs. W. and D. Downey have just built one entirely of this material; it would diffuse the light, too, very perfectly; therefore, if you can go to the expense of it, we should advise it. But plain glass, with a *papier mineral* screen, might answer as well.

Captain Turton.—We scarcely understand what you mean by Simpson's toning solution; but if it contained chalk, this would not interfere with its keeping qualities. See our advertising columns a week or two back, and you will find what you require. Try England's intensifier, again referred to this week; but if you employ the oxalate developer (see leaders), intensification is very rarely required.

Chas. Brown.—There is nothing particular about fitting a finder to a camera. You may obtain an ordinary lens for the purpose, from any optician, always sufficiently in focus never to require adjustment. This is fixed to the same baseboard as the camera, the instruments being parallel, so that when the baseboard is turned, both camera and finder move at the same time.

Sea-Bird.—We have not yet received your address; we have a pamphlet for you.

Photophilus.—Thank you for your communication, which shall have our earnest attention. We will write again next week.

A. Z.—Our only advice would be to put your silver solution into the residue tub; you cannot make a good job of it in any case.

Enquirer.—The collodion film will leave the glass on immersion in water acidulated with sulphuric acid. But see Photographic News for 6th June last, page 275, which will probably give you all you want.

Platinum.—Yes, your arrangement would no doubt answer; if you work in a dark room, however, there is no need for any tube between negative and lens. See "Mr. Blanchard At Home" a few weeks back; he has a similar makeshift arrangement (but not in a dark room) that answers well. You may work through your lens whichever way pleases you. You might make vignettes in the way you mention, but we doubt if you would find it practicable.

O. Morgan.—Put a drop of nitric acid upon it, and after a few minutes wash this off into a test-tube with as little water as possible. If a drop of hydrochloric acid causes a white turbidity, this is a pretty sure sign that it is silver.

G. F.—Ten grains of chloride added to one ounce of albumen is a good proportion. See "Mr. England at Home" on the subject of albumenizing paper.

PATENTS.

COMPILED BY MR. DES VŒUX,

Patent, Trade Marks, and Photographic Copyright Office, 32, Southampton Buildings, Chancery Lane, London.

No. 1291. John William Bailey, of 12, Edith Terrace, West Brompton, Middlesex, "Improvements in obtaining Transfers from Photographs on Enamel and other Substances." Dated 30th March, 1880.

No. 1303. William Robert Lake, of Southampton Buildings, London, "An Improved Apparatus for Holding and Exhibiting Photographic or other Pictures, and the like." A communication to him from abroad, by Theodor Muench, Vienna, Austria. Dated 30th March, 1880.

No. 1305. William Robert Lake, of Southampton Buildings, London, "Improvements in and Relating to Woven Fabrics with Photographs thereon to Preserve the same and fit them for the Application of Oil Colour." A communication to him from abroad by the firm of Wilhelm M. L. Winter and Co., of Vienna, Austria. Dated 30th March, 1880.

The Photographic News, April 16, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Process of Photography — Photographic Art and Photographic Science — The Illumination of Dark Rooms.

The Progress of Photography.—Had the jurors who reported on the photographs in the Exhibition of 1851 to perform a similar task to-day, most assuredly they would not pronounce such an opinion as the following: "Rapid as have been the discoveries connected with photography, and great the improvements since the invention of M. Daguerre, there is yet much to be done to enable it to rank amongst the sciences of the age." Photography has won its spurs since 1851, and of this there cannot be a better proof than a glance over the gorgeously-bound volumes of the jurors' reports presented to the British Museum. These volumes are four in number, and are illustrated by about a hundred photographs from paper negatives, in size mostly ten inches by eight. Whatever appearance these photographs may have presented nine-and-twenty years ago, the majority are sadly changed now, and only a few would seem still to have retained whatever glory they once possessed. We had the opportunity a few days ago of looking over these volumes, and were greatly interested with the glimpse of what must be called a past age. It was very curious to note the variations wrought by time. Most of the prints of a black tone were apparently unchanged, keeping an even colour up to the very edges of the paper. On the other hand, those of a chocolate hue had, with scarcely an exception, begun to fade at the edges, presenting a patch of brownish chocolate colour surrounded by a border of yellow. The oddest circumstance, however, about these chocolate-coloured prints was that in some instances the whites about the centre of the pictures had preserved their purity, while those at the edges had turned to the greenish-yellow sickly hue so well known to the pioneers of the black art. There were hosts of pictures which were full of stains, presenting a marble-like look, enough to make a modern photographer's hair stand on end. But, with all their defects, there is in these prints much food for reflection. Nor are the remarks of the jurors themselves without significance. Speaking of the progress of the art, even in *that* day, they observe: "Perhaps its advance cannot be more strongly proved than by one fact,—that the method at first adopted, a very few years since, for procuring Daguerreotype portraits, required that a person should sit without moving for twenty-five minutes in a glaring sunshine. The improvement, as shown in the almost instantaneous process of the present day, is most striking." This was written, be it remembered, before the full advent of collodion, and yet they had "instantaneous" processes even in those days! The jurors do not state precisely what duration of time they understood by the term "almost instantaneous"; but probably, with the recollection of five and twenty minutes of torture in their minds, they meant to imply about a minute or so. If this could be called instantaneous, what would they term the twentieth part of a second, the length of the exposure of many gelatine plates?

Photographic Art and Photographic Science.—In reading the report of the jurors it strikes one as a singular fact that while the whole of the exhibitors—English, French, American, German, and Austrian—have, with one exception—M. Claudet, who showed a Daguerreotype of the spectrum, the first on record—turned their attention to the artistic side of photography, the jurors seem to have had only its scientific aspect in view, and were, on the whole, dissatisfied with what had been done. Take the concluding paragraph, for instance: "In closing our remarks on this department of the Exhibition, we may be permitted to record some degree of disappointment at the absence of specimens of the application of photography to any department of representation other than such as please the eye or administer to personal feelings. As regards its application to an infinity of useful and instructive purposes, we have literally nothing! We find, for instance, no specimens of copies of ancient inscriptions (a few incidentally occurring on the Roman ruins, perfectly familiar to everyone, only excepted); no delineations of tropical or remote scenery; no specimens (for the single exception of Claudet's spectrum is hardly to be cited) of the actinic spectrum; or of natural vegetables or animal colours; no impressions of the lines in the photograph corresponding to those in the luminous spectrum; no magnified representations of the microscopic products of nature, or of the dissected parts of plants or animals; no copies of pages of ancient manuscripts, no miniatures of printed books (holding out the promise of future publications in miniature), or that of condensing in volume for preservation in the museums, &c., the enormous mass of documentary matter which daily more and more defies collection, from the mere impossibility of storage; but it will one day become matter of history, and a thousand other applications which it would be tedious here to mention." Putting this snub—to use no harsher term—by the side of the sneers and coldness with which artists until very lately have been accustomed to regard photographers, it is a wonder photography has made the progress it has. The scientific men—that is to say, those who have had what may be termed a scientific education—who have taken up photography may be counted on one's fingers. The improvements, the countless expedients, the never-ending experiments, have nearly all been made by the hardworking, unscientific photographer, whose enthusiasm in his art alone made him triumph over the bitterness and disappointment of innumerable failures. And nearly as much as the man of science is the artist indebted to photography. Errors in lighting, perspective, and posing, which were at one time common enough even with skilful artists, have been made manifest by the inexorable camera, and are now impossible. There are now not a few photographers whom no artist would be ashamed to class as of his own rank. It is no slight boast that in the comparatively short space of thirty years, photography has asserted its right to be considered both an art and a science.

The Illumination of Dark Rooms.—There is a gleam of hope that photographers may yet save their eyesight. Conjointly with the abandonment of ammonia in the development of gelatine plates, comes Captain Abney's bromo-iodide emulsion, and a welcome return to orange glass—at least, let us trust so. It is held by some—though we are not prepared to say with how much truth—that the fumes of ammonia in the dark room are more prejudicial to the eyes than even the abnormal expansion and contraction of the pupil, and the straining of the ciliary nerves. It is very certain that the photographer, first by a minute inspection of the image on the ground glass, with his eyes close to the screen; second, by the exposure to the strong light of the studio; and, third, by a precipitate plunge into Cimmerian darkness, tries his eyes very severely, and no wonder many men say that when they shut themselves up in their dark rooms to develop gelatine plates they feel quite dizzy and confused for a few seconds. Mr. Brudenall Carter, the well-known oculist, says, in his work on the diseases of the eye, "In the case of all the muscular efforts which are necessary to clear vision, fatigue, by producing relaxation of muscle, produces dimness of sight." If this be so, let photographers hasten to verify Captain Abney's formula, away with ruby glass, and take as much care of their eyes as they do of their cameras.

At Home.

CAPTAIN ABNEY AT THE SOUTH KENSINGTON MUSEUM.

In a remote corner of the vast establishment which has grown up of late years at South Kensington, among the workrooms and repairing lobbies, where works of art, statuary, models, pictures, &c., are set up, and generally put to rights, prior to their admission into the bright galleries of the Museum—behind the scenes, as it were, of the spectacular entertainment which is provided for the London public on such very cheap terms—is to be found one of the laboratories of Solar Physics. To come upon this laboratory, as we did, after traversing a quarter of a mile of brilliant glass cases and polished floor, of pleasant pictures, shining vases, and gorgeous war trophies that tempted one to linger at every step—to be ushered, we say, after this, into a sort of backstairs and lumber room department, was not agreeable. There was a cold, draughty, unfurnished look about the place, that caused you to wish yourself back again in the Museum itself, and it wanted all Captain Abney's warm reception and welcome to dispel these very unpleasant feelings.

To say that Captain Abney was busy photographing the red end of the spectrum, when we entered, need scarcely be set down; it is but a matter of course. We believe, in fact, that the region of the red is now universally admitted to be his own private domain; at any rate, there are very few physicists who would care to dispute the matter with him. Our readers are aware that the Bakerian Lecture at the Royal Society was this year delivered by Captain Abney, who chose for his theme the actinism of the ultra-red rays of the spectrum. It is not so long ago, despite Sir John Herschell's dictum, that the impossibility of photographing the lines in the red end of the spectrum was regarded as an impossibility; but, thanks to our advanced physicists, and particularly to Captain Abney, the ultra-red can now be recorded upon a photographic plate, if not as readily, at any rate as accurately, as the violet and ultra-violet portion of the spectrum. Until the publication of the Bakerian Lecture we must remain in ignorance of the particular method practised by Captain Abney, and of the nature of the collodion he employs; suffice it to say that it is not gelatine emulsion, but collodion emulsion, that has given him the perfect records he has so far been able to secure, and this emulsion is employed in a moist condition. His present investigations are confined to photographing light through various media, such as water, alcohol, glycerine, &c. Just now it is water, and he passes his light through a column of this medium no less than five feet in breadth. There is a long table; at one end shines an electric light, and the rays from this light are thrown by means of a condenser in a horizontal direction through a long tube, also placed horizontally, filled with water. At the end of this five-foot tube is the slit of the spectroscope, Captain Abney employing on the present occasion as many as five prisms to refract the rays; and at right angles to the spectroscope is the camera. We can see the red end of the spectrum limned in soft delicate colour here on the focussing-screen, and remark how intense the ruddy glow is in the centre of the image; it is, of course, but an accident that Captain Abney's assistants should be attired in the same colour, but the scarlet-coated Sappers, as they move about with dark slide or lens, are all in harmony with the experiment.

There are two openings in the wall of the laboratory, which appear at first sight like tiny windows; they are condensers for the purpose of employing solar light; and looking out into the open, you see beyond, the pedestals whereon stand the heliostats, which keep pace with the motion of the sun, or, rather of the earth, and permit a constant ray to be reflected into the laboratory through these condensers for hours together. In this way you may avail yourself very conveniently of the sun, when it shines, and carry on solar work with a degree of comfort and convenience that experimenters do not always enjoy in pursuing their physical researches.

Captain Abney, we are aware, is just now making experiments with iodide and bromide of gelatine emulsion, the addition of a small quantity of iodide not adding so much to the sensitiveness of the compound, as permitting the photographer to work the emulsion in a room less dark than that required for pure bromide plates. The addition of a proportion of iodide, in a word, seems to prevent fogging when the film is exposed to the light of an ordinary wet-plate dark room, and as it is obviously so much more convenient to work with much light than little, the addition of iodide is likely to serve a valuable purpose. In Captain Abney's opinion the best proportion of iodide to bromide is 15 to 120. To make his emulsion, he takes 15 grains of iodide and 120 grains of bromide, which are boiled for half-an-hour with 30 grains of gelatine, at the end of which time a hot solution of gelatine—containing 160 grains further of the dry material—is added. Captain Abney employs half French or hard gelatine in fine transparent cakes, and half the Nelson No. 1 gelatine, as ordinarily sold, cut into shreds. The emulsion is carefully squeezed through canvas prior to use.

The dark room of our photo-chemist is capable of all sorts of lighting. The collodion emulsion employed for photographing the red end of the spectrum appears to be more sensitive than the gelatine film, and very little light indeed is employed during its manipulation. So far as gelatine work is concerned, we may inform our readers that Captain Abney employs a gas jet with a glass globe, which globe is painted with a mixture of aurine and aniline scarlet applied by the aid of negative varnish. The aurine is an efficient substitute for yellow or orange, and the aniline scarlet for ruby glass or fabric, a combination which, as most of us know, is very effective in cutting off troublesome rays from the gelatine film.

Captain Abney has taken a leaf out of Mr. England's book, in the preparation of gelatine plates, and possesses an efficient cupboard of the England pattern, of which we gave a description and outline sketch last week. He gives the England cupboard a very good character, and has no difficulty in maintaining a constant temperature of something like 75° Fahr., which dries the gelatine plates effectually.

After development, and before fixing, our host makes it a practice to dip his gelatine plates into a saturated solution of alum; he prefers operating in this way rather than fixing the negative first of all. His development is carried out in white dishes of enamelled iron. They are somewhat after the shape of a Yorkshire pudding dish, and, besides being unbreakable, they have the advantage of showing when they are dirty and when they are clean.

Celloidin, of which many of our readers have doubtless some experience, and is a pure and very soluble form of pyroxilin made in Germany, is highly spoken of by Captain Abney. It is a whitish jelly-like compound, and appears to be especially useful in the preparation of collodion emulsion. We have a suspicion that it is precipitated and redissolved pyroxilin, but, in any case, it seems to be extensively employed by photographers abroad, if not in this country.

Our "At Home" next week will be Mr. Francis Bedford at Camden Road.

RETOUCHING.

BY JOHN MATTHEWS.

This art evidently merits the photographer's serious attention. Much has been said against its use, and as much for it. Opinions on the subject vary, but that it remains

amongst first class operators a necessary part of their process is undeniable. The art of retouching is greatly liable to abuse. A person has his portrait taken—he is, perhaps, an elderly farmer, his face freckled and marked with lines of care and age. The retoucher, in the exercise of his functions, makes the face on the negative as round and clear as a wax doll's. This is most clearly an abuse of its powers. It destroys the character of the countenance —characteristic marks peculiar to the individual are all worked out, and the portrait remains a mere resemblance of the sitter. Again, "retouchers" are frequently recruited from that class known to the profession as "dark-room assistants;" they imbibe a liking for it, learn a little of it, and the operator, to ease himself, teaches them more, until they can fairly work up a negative. When they can accomplish this, they, without thinking of what the face of the sitter ought to represent, dash away at it with the pencil until all recognition has nearly departed. I wish to say nothing derogatory to this useful class, but to point out that, being possessed of no technical education, no knowledge of drawing, which is necessary in retouching, they confound muscles and bones with freckles, unevenness, and discolorations of the skin, and they remove them all.

What sensible person who wishes for a portrait of himself—a likeness in the correct sense of the term, one which his friends may keep in remembrance of him, and one by which they may know him—would care for a waxy resemblance of this sort? Yet the answer of the retoucher to strictures on his work in the above respect is that the public demand pictures of this sort. This I unhesitatingly affirm from long experience, a fallacious statement.

We will say, for example, that in a town there are two photographers. The first depends for patronage upon good negatives, well-lighted and posed, and sufficient retouching to remove hardness from the negative, and those discolorations which appear so differently in a negative to what they do in the original. I will explain my meaning more fully on this point shortly. The second depends entirely on retouching: badly-lighted, dirty, and under-exposed negatives are to be remedied by the skill of the retoucher.

The prints in the showcase of the first—I will dub him the conscientious operator—give us what we always look for from photography, and without which it would lose its principal charm—truth. The prints of the non-conscientious operator take from fifteen to twenty years off the ages of his sitters. An old girl of fifty is made to show the roundness about the cheeks and clear complexion of twenty-five.

Now we come to that which gave rise to the fallacious argument of the retoucher mentioned above—that the public desire them. A few of these old girls of fifty, having never experienced any remarkable gratification from viewing a correct likeness of their interesting features, flock to the operator who retouches "not wisely but too well." Their example is followed by others, to whom flattery is sweet, and for awhile the tide of sitters is all in his favour; he appears to attract all the customers. But it soon turns; it is one of those shams which are only made more shammy by comparison with the real article—the same as skating rinks are with real ice. The impression soon gets wind that the unconscientious operator flatters, and the sitters that have so eagerly rushed to him are ashamed to show his productions for fear of being accused of that moral defection which caused them to go to him—vanity. The retouching operator has neglected that substantial part of his business, and now has to fall back upon it—bright, clear, only sufficiently retouched negatives—and his business suffers a serious loss by his former venture. For awhile his occupation, like Othello's, is gone.

Retouching in photography is of great value; it is a great power, and should be judiciously wielded. Negatives certainly require retouching, though there are some who deny it, who urge that it detracts from truth in the portrait. This is not so, however, if the retoucher understands his art.

I will now explain what I alluded to above in my remark about discolourations of the skin. To those who deny that retouching is required it will be a sufficient answer. Persons who are only slightly freckled exhibit to the eye very little difference in the colour of the skin, but see the difference in the negative; these freckles, being of a yellow tinge, so little affect the sensitive plate that on development they appear on the face as so many little black spots. Now I say to the opponent of retouching, are they to remain to make the likeness more true to nature? Retouching is necessary to remove these spots; and, as the light exaggerates those, so it does, in instances, wrinkles and furrows, all of which require the aid of the pencil; the freckles to be removed, the wrinkles to be softened. Retouching should contribute to strengthen, in truth, the art to which it is a necessary part; it should never flatter.

FRENCH CORRESPONDENCE.

Congress of the Learned Societies at the Sorbonne—Actinometry—Illustrated Works for Libraries—Meeting of the Photographic Society of France—Proposed International Copyright for Works of Art.

Congress of Learned Societies at the Sorbonne.—The annual congress of the learned societies of France has just been held at the Sorbonne. Photography was represented there in its habitual capacity of auxiliary to the Arts and Sciences, but no communication bearing on our art was made to the congress with the exception of those emanating from myself.

Actinometry.—In the Section of Science I gave expression to a regret that the laboratories of physicists and chemists as well as those of photographers, that astronomical as well as meteorological observatories, are not as yet furnished with the proper instruments for estimating the chemical intensity of light. Like my learned colleague in England, M. Warnerke, I first passed in rapid review the different systems of actinometry, and then pointed out how it was necessary, on account of the delicate manipulation required in using them, to reject all those which depended on chemical combination or decomposition. I exhibited M. Warnerke's ingenious instrument, founded on the phosphorescent properties of certain bodies, and I gave a description of the advantages it possesses for special purposes; but, as I explained, it does not answer for a laboratory or observatory photometer, where continual observations are required for comparison with one another. It is, however, a clever invention, and I believe there are numerous purposes to which it may be applied. But my own object is to produce a photometer capable of being used in all scientific laboratories and observatories where it is required at any moment to know in degrees the actual value of the luminous intensity. I want to have a resisting instrument which will give by simple inspection the actual degree of actinic force, as the thermometer gives the degree of temperature, and the barometer that of atmospheric pressure. The apparatus suggested and experimented with by M. Marchand, and afterwards improved by M. Warnerke—that one, namely, which depends on the chemical decomposition of iron oxalate—is capable of rendering good service, and, properly manipulated, will furnish observations of very great accuracy; but, unfortunately, it requires special care in using, and is therefore not adapted for general purposes. In the first place, the chemical substances used must be in a state of absolute purity; then, the standard of the liquid employed alters with the length of time during which the decomposition

takes place; next, the fresh solution made to replace that which has suffered the extreme limit of decomposition must be saturated with carbonic acid,—all these are questions which are easy enough to men accustomed to chemical manipulation, but which in the majority of cases, and for ordinary purposes, are difficult, if not impossible. Notwithstanding the objections against it, the photometric process, which depends on the amount of discolouration of sensitive paper effected by the action of light, seems to me to be the best and simplest for ordinary use. Besides, the observations taken by means of it are of quite sufficient accuracy, even if the inevitable errors due to atmospheric moisture and other unavoidable causes be neglected. What is, above all things, required, is a typical form of instrument and a uniform graduation, which may be adopted by all observers, so that the observations can be compared among themselves. The typical instrument which I proposed to the Section, and which I am at present having constructed, consists simply of a box of small volume. Inside this box is a strip of sensitive paper, passing over two cylinders, and beneath an opening 6 millimetres wide and 10 long. The cylinders are moved by clockwork, and make the paper to pass forward beneath the opening at intervals of a minute, so that a band of the fillet of the same size as the opening remains for a minute exposed to the action of light. At the end of an hour we have a fillet of paper divided into sixty distinct bands. According to the length of the strip, the observations may be extended over a dozen hours, or even more. By means of a scale of comparison attached to the box, formed of some permanent colouring material, and containing twenty different tints, the degree of luminous intensity may be read off. The error in reading, therefore, cannot exceed a fortieth. To make comparison of observations possible, we must have absolutely identical scales for all the instruments, and fillets of sensitive paper prepared under the same conditions. In a small compartment in the box, constructed specially for the purpose, is placed a glass dish of calcium chloride, to keep the inside perfectly dry, and if a greater degree of sensitiveness is desired, it can be obtained by putting in also a fragment of carbonate of ammonia, as recommended by Dr. van Monckhoven. The plan which I submitted to the meeting, and which met with unanimous approval, is to have a committee of competent judges, who shall fix a standard for the apparatus which can be universally adopted; and as the question is one of international interest, I hope to receive hints and advice from other countries, and more especially from England, where photography and meteorology are so much cultivated. I forgot to mention, that by means of a screw any part of the scale of comparison may be moved opposite the opening, so as to obtain an immediate observation of the luminous intensity without being compelled to remove the fillet from the box. This photometer is rather a cabinet instrument than a piece of photographic apparatus; but a well-arranged photographic studio will lose nothing by keeping it in action.

Prints and Illustrated Works for Libraries.—In the Fine Art Section of the Congress I expressed a wish that some general rule should be laid down to prevent all drawings and prints not of a permanent character from being deposited in libraries; under the head of permanent works I would class only those in carbon and platinum. To keep stored in a public library a mass of books and prints which are so exposed to the action of time, is really a great mistake. If this rule is to be adopted in France, it must be of general application in other countries also. Photography can only be a gainer by it, for the manufacturers will produce only permanent works when they perceive that those of unstable colour are refused admittance to our libraries and our collections.

Meeting of the Photographic Society of France.—On the 3rd of this month our Photographic Society held its ordinary meeting. It was largely attended, but the number of novelties brought forward was small. M. Stebbing exhibited an instantaneous shutter, very simple in action. To prove its value he also showed a picture that he had taken of a crowd on the river-bank, while himself standing with his instrument on the deck of a passing steamer. M. Davanne read the report of the committee appointed to draw up the rules for the prize competition of 2,000 francs, offered by the Minister of Public Instruction for the greatest improvements introduced into photographic lenses. This prize is only offered to French manufacturers, but it will, it is to be hoped, excite the emulation of opticians of other countries, who, if they cannot compete, may be at least induced to do better than those who can. So soon as I know the exact conditions of the competition, I will send them to you.

Proposed International Copyright for Works of Art.—At the same meeting of the Society a very important subject was discussed—one which is just now occupying the attention of the whole photographic world. This relates to the question of securing the right of property in photographic works. There are, at present, two bills before the Chamber of Deputies, one relating to the copyright of works of art, the other to that of manufactures, intended to replace the law of 1793. Now both of these bills ignore photography as being neither art nor manufacture, and a special law is now demanded for photographic works also. The present system results in photography enjoying no direct protection, and in the case of unauthorised copying it became necessary to resort to the common law. The great body of photographers feel that their art should be placed on the same footing as the industrial arts of reproduction, such as engraving and lithography, and they claim for it the protection of the law of copyright for works of art. It is not a question of comparing a photograph with the work of a celebrated master, but one of establishing the principle that reproductions taken by the aid of light have as much right to be considered works of art as more than half the prints and drawings which are sold under that title. There is really at the bottom of the whole affair much prejudice and red tape on the part of the enemies of photography, who fear lest the popularization of our art will diminish their number, and who think they have said everything when they pronounce the oft-repeated words: "Photography is not a fine art." There will, probably, be a long and exciting struggle over the question, of the course of which I hope to keep you informed. Meanwhile it concerns the dignity of our art that it be not shelved by the preconceived notions of its opponents. It will be difficult to obtain for our art its true position, but nothing is gained in this world without trouble; certainly our proposed reform is worthy of all the trouble we can bestow on it, and as it is international in character, we rely for aid also on other countries.

Leon Vidal.

NOTES ON THE GELATINE EMULSION PROCESS, WITH A PRACTICAL DEMONSTRATION OF THE PREPARATION OF THE EMULSION, COATING OF PLATES, ETC.

BY THOMAS CHILTON.*

Regarding the gelatine: I have been using Nelson's No. 1 for some time, but during the warmer weather of last summer I had considerable difficulty in getting my films to set, even after standing for hours. Lately I have been using No. 2, which is a harder sample of gelatine, and probably one which will act better. I have made three or four lots of emulsions by different methods, using a new gelatine made by Nelson, known as "Special X"—strength, fifteen grains per ounce. It is a considerably harder sample than No. 1 or 2, and sets

* Continued from page 160.

very firm. Although the physical properties of this gelatine are very good, I am sorry to say, as yet, I have not been able to produce a negative which had not a reddish tinge. You will find here samples of these three gelatines.

In the year 1877, I brought for your inspection a plate (transparency) having a dull and moist surface, caused by imperfect washing after fixing, to prove that the dulness might be removed by holding the part affected under a stream of water, and lightly rubbing with cotton wool, part of the defect having been removed in this manner. I again bring the same plate before you to-night; and, although it has been exposed to temperatures varying from 30° to 90° Fahr. for two years and four months, the greater part of the time lying on a shelf without any special care, you will see that the part which was thoroughly washed remains as clear and as bright as ever, whilst the part which was imperfectly washed has still the moist appearance, but more discoloured. This, I contend, speaks volumes for the keeping qualities of gelatine negatives when thoroughly washed.

Stone bottles, such as used for ginger beer and ink, are very useful for mixing and keeping emulsions in, for, as you are aware, they are perfectly light-tight, and need no wrapping up. On the bottle I write with black varnish (which will not wash off when the bottle has to be placed in warm water) the particulars of the contents. This may seem a trivial item to call your attention to, but I think their usefulness is not generally known. I mixed and kept emulsion in glass bottles for years, until recently, on visiting a brother-amateur, I was shown one of these stone bottles, and have used them ever since, to my delight.

I have here a very convenient box (size $8\frac{1}{2} \times 6\frac{1}{2} \times 3\frac{1}{2}$ inches) useful for washing pellicles in, either gelatine or collodion. As you may see, it joins near the centre, and has a top and bottom of horse-hair seating. The smallest particles may be washed in it without loss, and I can speak of its efficiency, having had it in use three or four years.

We will now proceed to the preparation of the emulsion and plates. The method of attaining a high degree of sensitiveness in a few minutes by the application of heat is now being very generally practised. In this case the greater quantity of gelatine is added after the emulsification. Having worked the above modifications with success, I now present a formula which is capable of giving good results, the quantities used being for two ounces of finished emulsion, for which we require gelatine, silver nitrate, ammonium bromide, alcohol, and distilled water. Weigh out two lots of—

Gelatine, Nelson's No. 2,	15 grains and	36 grains
Silver nitrate (best)	... ...	33 ,,
Ammonium bromide	... ...	20 ,,

We now take a stone bottle (substituting on this occasion, in order that you may see the change which occurs, an ordinary glass bottle of the capacity of about six ounces). Empty the twenty grains of ammonium bromide into the bottle, add one ounce of distilled water, shake well to dissolve the salt, now add the fifteen grains of gelatine, and allow it to soak for about five minutes; then apply heat, and the gelatine will readily dissolve on shaking. The thirty-three grains of silver nitrate, having been previously dissolved in four drachms of distilled water made warm, are now added to the bromised gelatine solution in small quantities—say, a drachm each time—shaking well after each addition. The change which has now taken place may be described thus:—The silver nitrate combines with ammonium bromide to form silver bromide and ammonium nitrate—

Silver ——— Ammonium
Nitrate ——— Bromide

The resulting rapidity of the plate to be prepared may now be determined. We may produce a plate of ordinary rapidity, or one of extreme rapidity, according to the amount of heat applied to the emulsion.

A very rapid plate may be obtained by placing the bottle containing the emulsion in a pan of water about 90°F. (having previously removed the cork, and covering the mouth of the bottle with a loose-fitting cover to prevent light getting to the emulsion), and applying heat until the water boils, then removing the pan, and allowing the water to cool to about 90°. Now take the bottle, and add the other quantity of gelatine, viz., thirty-six grains, having previously soaked this gelatine in one drachm of water. On well shaking, solution will be effected, and the emulsion is now ready to have the crystallisable salts removed, viz., the ammonium nitrate, the gelatine, which may have become soluble owing to the application of heat, being removed at the same time. The plan to be adopted will mainly depend on convenience. After removing the crystallisable salts the emulsion is dissolved, and one drachm of warm alcohol added. We shall now have two ounces of emulsion, which, after filtering through cotton wool, may be used for coating plates, or may be kept for months, if required. To coat the plates the emulsion is poured near the centre and guided over the plate with a thin glass rod, draining slightly. It is now placed on a levelled piece of plate glass, and in a short time the films are set, and may then be transferred to a drying-box. My drying-box arrangement is the same as formerly described, with the exception of the box being larger, viz., $28 \times 13 \times 13$ inches.

For developing, the formula given by Messrs. Wratten and Wainwright for their instantaneous plates is used in the case of the most rapid plates prepared by the method as above. For the slower plates a modification of the same formula is employed. For two ounces of pyro. solution add three or four drops of the ammonia solution, with the addition of one or two drops of a twelve-grain solution of potassium bromide. When the image appears, add two or three drops more of the ammonia solution, and apply until sufficient density is attained. The plate is then well washed and placed in the hypo. solution. When the operation of fixing is completed, wash thoroughly, and rear up to dry. If the plate be covered two or three times with alcohol it may then be dried in a few minutes by the application of heat.

The portrait negatives before you have been produced from plates prepared by the formula as worked to-night. I am indebted to Mr. Gregory and Mr. Binns for their kindness in exposing, developing, and printing from the above plates. The landscape negatives have all been produced by Mr. Bennett's formula, the time of emulsification being forty-eight hours, and developed by the last method described in this paper. A few have been intensified with pyrogallic acid and silver solution, using part water and part beer. Two have been intensified with the bichloride of mercury and hyposulphate solution, and, although they looked very nice when first done, they have now a very unpromising appearance. I shall in future use the silver intensification unless something better appears.

Method for the Detection and Estimation of Iodine in Presence of Chlorine and Bromine. By E. Donath (*Zeits. Anal. Chem.*, 1880, 19—23).—The author was led to the present process from some observations of C. Zulkowsky in a paper "On an Iodometric Estimation of Chromic Acid." The process consists in the distillation of the mixed chlorides, bromides, and iodides with chromic acid solution, when the chlorides are found to be entirely, and the bromides almost entirely, unacted on, especially in dilute solution, the iodides being decomposed according to the equation

$$6KI + 8CrO_3 = I_6 + Cr_2O_3 + 3K_2Cr_2O_7,$$

the resulting iodine being collected in a solution of potassium iodide and determined in the usual manner.—*Journal of the Chemical Society.*

The Photographic News.

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MODERN DARK ROOMS.

The gelatine era in photography must necessarily bring about a radical change in the dark room. A closet that serves very well for the development of wet plates is altogether unsuited to gelatine work, and since gelatine has undoubtedly taken the *pas* of collodion, it ought now to receive our first attention. In other words, instead of making the present arrangement do for collodion work, it were well to fit up the dark room so as to render it fit for gelatine development, and make wet plates a secondary consideration.

There are two points of importance to consider in respect to a modern dark-room: illumination, and the medium through which this shall pass. So far as the medium is concerned, ruby glass or ruby fabric is of course indispensable, but opinions vary very much as to its application. Mr. Baden Pritchard was the first to point out in these columns that ruby glass, even of double thickness, afforded no trustworthy protection to a sensitive gelatine film; he told us how he had been able to secure a stereoscopic picture with an exposure of three minutes, with the lenses obscured, if the term may be used, by two thicknesses of ruby, but that an orange glass and a ruby glass combined, effectually cut off the actinic rays. For the modern dark-room, therefore, a combination of orange and ruby should be chosen; but as there are various shades of these colours, a practical test is very necessary. Mr. Parsons, in these columns a little while ago, suggested that the ruby glass employed should be "ground or smoothed on one side," and in Mr. Thomas Gaffield's interesting letter which we recently published the same advice is given. As Mr. Gaffield pointed out, the grinding of the glass cuts off something of the light, and does not, as it is often supposed, increase its transmitting power. If you are enlarging a negative, and interpose a ground glass between the source of light and the transparency, there will at once appear an apparent improvement in the lighting upon the focussing screen; but this is due, not to increased illumination, but to a breaking up and better diffusion of the existing light. If ground glass, therefore, diffuses light, it is obvious that in the modern dark-room ruby glass with a ground face would be an advantage. Mr. Gaffield writes:—"You will be surprised by the contrast between the ground and unground ruby."

Mr. Gaffield, inclines to the use of ruby and orange, or ruby and yellow; but grinding one of the surfaces deprives the glass "of the dazzling effect which always accompanies ruby glass or ruby glass and orange combined." But if it is not a question of stopping sunlight or even daylight, the precautions need not be so severe. In many studios we have recently visited, the illumination of the dark rooms has been artificial, and there is little doubt that in the manipulation of gelatine plates a candle or gas flame will come to be generally adopted. In the large dark rooms of the Autotype Company, at Ealing, gas is employed; Mr. England uses it at Notting Hill; so do Mr. Mayland in Regent Street, and Captain Abney at South Kensington. Moreover, in the first two instances, the gas flame is, so to speak, outside the dark rooms, and does not, therefore, add to the noxious vapours and vitiate the atmosphere of a confined space. The lamps fitted with ruby fabrics which are now to be purchased are exceedingly practical, whether for gas or candle, and they afford illumination of a much more constant character than a window lit up by daylight, although Mr. William Bedford told us the other day that, despite a deep red screen, his gas flame sufficed to give a transparency in five minutes. Captain Abney gets the ruby and yellow combined by painting his globe with aurine and aniline scarlet. Candles may be purchased, so many to the pound, whose illuminating power practically never varies, so that the development of gelatine plates may be conducted by a standard light.

WEIGHTS AND MEASURES.

We think photographers must give up looking upon grammes and cubic centimetres in the light of foreign weights and measures. The latter are as much British in the eyes of our chemists and physicists now-a-days, as are pounds and ounces, avoirdupois, to the butcher and baker. Scientific men, indeed, whether they are English, French, German, Italian, Russian, Scandinavian, or American, all employ these terms, for the simple reason that none other meet their requirements so well. It is the decimal system asserting itself. Ten years ago Germany had no more implacable foe than France, and yet at that very moment the roads of the German Fatherland were being measured into kilometres. The Germans, it is true, still stick obstinately to their Réaumur thermometer, in the same way as we make calculations in this country by Fahrenheit; but when a German or British savan communicates a memoir or a result to the learned societies, he takes care to express himself in harmony with Celsius, or the Centigrade thermometer, as it is indifferently called. Not only is the temperature more easy to calculate with the Centigrade thermometer—for one can easily divide the degrees into tenths, if they are not small enough, and thus secure at once a very delicate test—but the expression, being international, is understood by men of science just as well in one country as another.

The Germans have already gone further than we have. They have not only adopted the kilometre as their "milestone," but taken the kilogramme into their houses and made a domestic weight of it. We, on the other hand, still muddle up ounces and pounds avoirdupois, with those of troy, and talk of fluid ounces to mark the difference between the apothecary's and grocer's measurement. The number of grains in an ounce varies according to the nature of the ounce, the grain being about the only fixed weight we have.

Since, then, not only all foreign chemists and photographers employ the decimal system, but all British chemists into the bargain, we cannot see how photographers in this country can do otherwise than follow suite. They must get out of their idea that the gramme or metre is French or foreign; they are international, and every formula that comes to us from abroad will be expressed by them. The gramme and cubic centimetre are, as our readers know, one and the same thing, except that the former relates to solids, and the latter to liquids. These are the two terms with which photographers have mainly to do, and which have caused our friends in this country endless trouble in effecting a translation into British measurements. It is all very well to be told that a gramme is equal to 15·43 grains, or that a cubic centimetre is exactly ·00176 of a pint; there remains still the vexatious task of "long multiplication," as it is termed at school, with a very good chance of an error at the end. It is true these figures might be entered in a note-book, and when we had to do with a decagramme, or kilogramme, there would then only be the task of multiplying with 10 or 1,000 to attain one's result.

But a simpler plan, and one we earnestly urge upon our friends, is to purchase a few gramme weights and a cubic centimetre measure. The latter are now as easily and cheaply obtained as the older weights and measures, which sooner or later must become obsolete.

Notes.

Science will be but inadequately represented in the newly-elected Parliament. Sir John Lubbock, who sat several years for Maidstone, has lost his seat, and although we may congratulate ourselves upon the election of Professor Story-Maskelyne, F.R.S., of the British Museum, it will scarcely compensate us for Sir John's absence.

Professor Story-Maskelyne, who headed the poll at Cricklade, was, of course, compelled to resign his Government appointment before election. As Professor of Mineralogy at Oxford, and Keeper of the Minerals at the British Museum, he is well known, and his name, as our readers will remember, was recently before the public in connection with the manufacture of diamonds. It was to Professor Maskelyne that the question of their genuineness was referred, as one of our highest authorities on the subject of precious stones.

There is little doubt of Dr. Lyon Playfair's re-election for the Universities of Edinburgh and St. Andrew, although the polling does not close until to-morrow. Dr. Playfair is in the foremost rank of chemists, and has been President of the Chemical Society, while, when Professor at Edinburgh, he stood so high that he was chosen as science teacher to the Prince of Wales and Duke of Edinburgh. Dr. Playfair, it will be recollected, occupied a seat in the Cabinet at the time of the last Liberal Administration, and filled the appointment of Postmaster-General.

An amateur writes:—"I am glad to see you are making a point about the importance of having photographic text-books written in more simple language. The modern photographer would be a very nice fellow indeed if he wasn't so awfully scientific. No doubt, we must all progress, but there are many amateurs like myself, who hesitate about going into photography lest they should hopelessly get into deep water."

In conclusion, our correspondent says:—"I think the author should bear in mind the words of the *Bourgeois Gentilhomme*, he may always suppose his reader to be a thorough chemist, and yet have regard to M. Jourdain's request: '*Mais, faites comme si je ne le savais pas.*'"

The portrait of a smoker "blowing a cloud" is the last feat in photography. Mr. William Bedford succeeded in getting this picture of smoke while testing the sensitiveness of some gelatine plates he was preparing.

Mr. Bedford, in printing, adopts the simple plan of placing a thick sheet of blotting paper impregnated with a solution of bicarbonate of soda—dried, of course—next the albumenized paper in the pressure-frame in winter or dull weather. This precaution suffices to keep the paper white for some days, in case it should remain so long in the printing-frame.

The electric spark has been employed for a novel purpose. At the annual meeting of the Paris Physical Society this month, M. Trouve placed his electrical polyscope in the stomach of a fish swimming in an aquarium, and without its seeming to suffer any inconvenience, it radiated a light equal to one common candle.

Dr. Siemens is continuing his experiments "On the Influence of Electric Light on Vegetation," and believes that the time is not far distant when market gardeners and nurserymen will employ electric illumination as a valuable auxiliary. At the Royal Society, the other day, he showed two pots containing strawberry plants, both grown in daylight, but one submitted to the influence of electric light at night. The latter bore a cluster of large red strawberries, while in the other pot the fruit was still green. According to the President, who tasted the fruit, the ripe strawberries were excellent.

While on this subject, we may mention that a Kentish gentleman of our acquaintance manipulates the sunlight to some purpose in the ripening of his wall-fruit. Leaves judiciously removed from the front of a peach, permit the sun to colour the fruit in accordance with the gardener's wishes, the photographic action of the solar rays being kept under control with rare skill. Very good-looking peaches are the result.

M. Levitzky, the Court Photographer at St. Petersburgh, has introduced into his studio the electric light on the Van der Weyde principle. A peculiarity of the process—one already observed by M. Liébert and others who have employed the light of the electric arc in photography—is, that metallic reflections, like those given off by medals, epaulets, buttons, &c., are much more sharply intoned than in an ordinary photograph taken by daylight.

The "Berlin-wool case," as it is called in legal parlance, is again to be tried, and as an important point of copyright is involved, photographers have an interest in knowing which way the matter is definitely settled. *Bow Bells*, it will be remembered, issued a Berlin-wool pattern of Millais' well-known subject, "The Huguenot"; the judgment of the Court below was to the effect that this was an infringement of copyright, and a penalty of £6,250 was inflicted upon the proprietor of the paper. Under these circumstances an appeal is to be made this week to the Lords Justices at Lincoln's Inn.

In our recent "At Home at the Criminal Investigation Department, Scotland Yard," we remarked upon the opinion of the detectives that a portrait to be easily recognized should not be taken full-face, but in half profile. The salient points and more striking lines of the face are thus at once apparent, and we find that gentlemen who combine the arts of sculpture and photography, like M. Adam-Salomon and Mr. Bassano, also choose for their modelling profile portraits, thus affording good proof of the correctness of the view taken by our detectives.

Intensifying negatives by exposure to light—a plan in favour with Mr. Blanchard—is referred to in the current number of the *Archiv.* A glass negative, neither intensified nor fixed, is well rinsed and put to dry in the dark. On the glass side of the plate are pasted one or more strips of paper, and it is then placed in the window with this side towards the light. In a shorter or longer time, according as the light is bright or dull, the parts of the image not protected by the paper will be found to be intensified. When sufficiently intense, the paper can be removed, and the negative fixed. In printing, the intense parts will give a much more brilliant and vigorous picture than the others.

This method of intensifying may, of course, be employed for strengthening any part of the negative. It is only necessary to mask that portion of the image that we wish to keep low in tone by means of pieces of black paper cut to the required size and shape. In this way groups of trees in landscapes can be made more prominent, and even in portraits a careful covering of certain parts will render retouching unnecessary.

Gelatine dry plates must have taken firm root, judging from the number of manufacturers springing up almost weekly. We this day welcome in our announcements an old friend with a new face, and wish him every success.

From photographs of the solar spectrum taken at different heights, M. Cornu believes that the ultra-violet limit of the solar spectrum varies to a small extent with the height above the sea-level, owing to the absorptive power of the atmosphere for ultra-violet rays. The rate of variation corresponds, he says, to theoretical values deduced from the hypothesis of a homogeneous absorbing atmosphere, provided equally clear days be chosen. The extension of the spectrum expressed in wave-lengths is, according to M. Cornu, one-millionth of a millimetre for a rise of 900 metres.

Many of our readers, no doubt, when in Paris, have been struck with the vast pile of buildings called *La Salpêtrière;* it is an asylum for the aged and insane of the female sex. The wards devoted to hysterical, epileptic, and somnambulistic patients are under the charge of Dr. Charcot, so well known for his researches into the pathology of nervous diseases. To aid him in his investigations, he has established a laboratory for the study of the nervous system with the same exactitude and closeness as are devoted to that of general physiology. Attached to this laboratory is a photographic atelier, in which the outward symptoms of the principal phases of mental disease are reproduced. The photographs taken there have been collected into an album, which is published by MM. Bourneville and Regnard under the title of *Janographic Photographique de la Salpêtrière*, and forms an exceedingly valuable addition to the library of the student of nervous disorders.

Topics of the Day.

THE THEORY OF THE GELATINE EMULSION PROCESS.

BY DR. H. W. VOGEL, OF BERLIN.

Gelatino-Bromide of silver plates, which have lately come so much into use, possess many properties presenting important variations from those of collodion plates—variations which, at first sight, seem to be inexplicable, or, at any rate, are not easily accounted for on generally accepted principles.

1. It is well known that in the case of *collodion*, the silver bromide, prepared with an excess of silver nitrate, is decidedly more sensitive than that prepared with an excess of the alkaline bromides. With *gelatine* plates, on the other hand, the emulsion prepared with an excess of silver nitrate not only shows no greater sensitiveness over that prepared in the other way, but also exhibits so many defects (for example, the appearance of red fog), as to render questionable its practical value.

2. In *collodion* plates prepared with excess of soluble bromide there is, moreover, observed a very marked elevation of the sensitiveness when pyrogallic acid, gallic acid, tannin, and other similar substances are flowed over them. *Gelatine* plates, on the contrary, so far as my own experience goes, show no corresponding signs of improvement, under certain conditions, except in the solitary case when pyrogallic acid is used.

3. *Collodio*-bromide of silver emulsion does not obtain an increase of sensitiveness from the addition of ammonia, whereas the sensitiveness of *gelatino*-bromide is doubled by it (Eder).

4. In the presence of chemical sensitisers—such as silver nitrate, morphia, gallic acid, &c.—*collodio*-bromide is rendered sensitive to the yellow, red, or green rays by means of certain pigments; in *gelatino*-bromide this action of pigments is only observed in a very slight degree, as recent experiments have served to convince me.

5. *Collodion* emulsions do not become more sensitive by long-continued emulsifying; the sensitiveness of *gelatine* emulsions is wonderfully increased by this means.

These divergences are so large that, if originally we had known of gelatine emulsions only, our views on the photo-chemistry of silver bromide, &c., would have been radically different. How, then, are we to explain these apparent contradictions?

Foremost in importance we have to consider the *substance* of which the film is composed. Now, to all appearances, the collodion film is chemically quite inactive—I put out of the question here decomposition, which may be set up in the course of time, and have an injurious effect on the latent image. Pyroxyline is not affected by tannin or silver nitrate; with gelatine the circumstances are different. As we know, the latter is tanned by contact with tannin, and becomes altogether altered in character; it is changed into a leathery mass, which is with difficulty penetrated by a liquid such as the developer. The obstacle it thus presents to the process of development quite overcomes the favourable action of tannin produced during exposure.

Similar is the case if we employ silver nitrate in excess. This substance forms with gelatine a compound which cannot be decomposed even by long-continued washing in water, so that an appreciable quantity of silver nitrate remains in the washed emulsion. An excess of silver nitrate in the gelatine, therefore, acts in the same way as an excess of nitrate in an insufficiently washed collodion emulsion; that is, it gives with the alkaline developer a fog, and this fog completely ruins the favourable influence of the nitrate during exposure. Besides, nitrate of silver has the effect of making the gelatine horny (Dr. Lohse).

Morphia, which is a good sensitizer of collodion plates, acts unfavourably on gelatine plates; probably this is due

to some reaction on the gelatine. In this respect, the behaviour of gelatine with each separate sensitizer must be studied alone, in order to be able to judge what will be its effect on gelatine emulsion plates. Since, then, if the action of so many sensitizers on gelatine plates is a very slight one, it is not surprising that there is no very perceptible action of the colouring matters which renders silver bromide in collodion sensitive to the red, yellow, &c., rays; for, as I have before had occasion to explain, the action of these colouring matters depends essentially on the presence of the sensitizers under consideration.

Now, up to the present, it has not been found possible to make a collodion emulsion of equal sensitiveness with one of gelatine, either by means of long-continued cooking, or by the addition of ammonia. This fact can be explained by reference to the different modifications to which silver bromide is subject, according to the investigations of Stas. The eminent Belgian chemist has described a highly sensitive form of the bromide of silver produced by continuous boiling of the salt in water for many days together. It is so sensitive that exposure to the flame of a Bunsen burner for a couple of seconds is sufficient to produce blackening, and so finely divided that it remains suspended in water. Similar to the effect of boiling in water, as stated by Stas, is the long-continued stewing of the gelatine emulsion. Now cooking a collodion emulsion has not the same beneficial effect, but this is due to the fact that in this combination the silver bromide exists in another and denser condition, which cannot be changed to the finely-divided modification of Stas. That such conditions really exist has been proved by Dr. Szekely; he precipitated bromide of silver from an aqueous solution containing glycerine, according to Abney's formula, washed it, and then emulsified it by stewing it with gelatine. By this process he obtained a very uniform emulsion, which had about the same sensitiveness as that of wet plates, and which was not rendered more sensitive by cooking for several days. It thus appears that the bromide precipitated from an aqueous solution has different properties from that produced by precipitation in gelatine. Similar properties, however, are apparently possessed by silver bromide precipitated in an alcoholic solution. Silver nitrate is known to be very scarcely soluble in alcohol, and the small amount dissolved in that liquid has the tendency, especially in the presence of ether, to become insoluble, and to precipitate in tolerably large particles. No wonder, then, that the silver bromide precipitated from such a solution should be thrown down in a denser condition than is the case in an aqueous solution. Owing to this state of density, the decomposition of the salt by the action of light, and by that of the developer, is hindered, and thus may be explained the want of sensitiveness. Personally, I feel sure that by some contrivance it will be made possible to obtain the silver bromide in a finely-divided condition, and to incorporate it with the collodion.*

We come now to another point for consideration, namely, the colour of the bromide. Stas states that the finely-divided pearl-white bromide of silver is immediately turned to a deep yellow colour on contact with ammonium bromide. This change of colour goes hand in hand with the absorption of light, and only that kind of light which is absorbed acts chemically on the silver bromide. Now since yellow bromide of silver absorbs blue light much more powerfully than white, it will also exhibit greater sensitiveness to the blue rays. In this way, the physical properties of silver bromide may have an effect on its sensitiveness. There is, however, the condition that the salt must remain in a finely-divided state. Should the bromide, when it assumes the yellow modification, be rendered coarser in grain, its facility for reduction of development will be lessened, and for this reason its sensitiveness will be affected.

* Dr. Wolfram, of Dresden, has patented a process which seems to point in this direction.

There is still a point to be considered: gelatine which has become partially decomposed by long cooking acts appreciably as a sensitizer. Dr. Lohse has observed that when gelatine alone is cooked for a long time, and then used for making an emulsion, the latter is found to be very sensitive.*

In the experiment of Dr. Szekely above described, it must be confessed, this sensitizing power of the gelatine has no effect; this, however, is caused by the silver bromide being present in a coarser state, and, according to Dr. Eder's observation, it will not be rendered finer, but rather coarser, by longer continued heating.

The longer the gelatine emulsion is cooked the greater will be the quantity of the products of decomposition; and it seems to be highly probable that these products, like all the results of spontaneous decomposition of organic matter, have a reducing action. There is also another cause: both Dr. Eder and Dr. Lohse have proved that ammonia is formed when a solution of gelatine is kept hot for a long period of time. Now when ammonia comes into contact with a substance capable of reduction it acts as an alkaline developer; that is, in this case it reduces the bromide of silver. It is well known that even silver bromide which has never been exposed to the light is gradually attacked by an alkaline developer. Hence also it arises that after very long-continued emulsification an emulsion will give plates liable to fog.

Berlin, 1st April, 1880.

The "Topic" for next week will be "Notes on Spence's Metal," by Mr. Léon Warnerke.

ON DEFECTS IN THE GELATINO-BROMIDE PROCESS.

BY DR. J. M. EDER.†

The following review of the imperfections of the gelatine process is, perhaps, the most complete that has yet been published. Before writing it, I have carefully collated the experiments made by Toth and by myself with those of other investigators, and though it may not be exhaustive, those who consult it in the majority of cases, will, I hope, be able to find the information they require. Later writers may, perhaps, use it as a model.

1. *Defects in the Emulsion.—a.* When the gelatine emulsion is flowed over a glass plate, and does not set for a long time, though the temperature of the air and of the plate is not very high, place the plate on a cold metal or stone slab (temperature 10° C.) If that produces no effect the emulsion has been spoiled, either by continued cooking at a great heat (60° to 100° C.), or by repeated alternately melting and solidifying, the latter being specially injurious when the gelatine is of inferior quality. For this reason it is better not to keep the stock of gelatine emulsion warm, after it has been melted for preparing plates, but to plunge the flask at once into cold water; by this means the gelatine sets again quickly, and prevents a sediment of silver bromide from being deposited. When gelatine is heated continuously for a long time with ammonia it loses its property of solidifying, and the same happens to an emulsion digested with more than five per cent. of ammonia. An emulsion of this kind, which will not set, is very difficult to put right again: perhaps the best means is to add to it about half its quantity of the original gelatine. Should its ability to set be not quite destroyed, or if the jelly be too soft and pasty, the addition of gelatine will also effect an improvement, or the same result can be produced by pouring in about a quarter per cent. of alum dissolved in a little

* My own experience is that boiling the gelatine is by no means so effectual in increasing the sensitiveness as keeping it hot at a comparatively low temperature for a long period of time. This I attribute to the fact that the products of decomposition of gelatine at a high temperature are different from those produced in a lower temperature.

† *Photographische Correspondenz.*

water. By long keeping the gelatine will often putrefy, and then it becomes fluid of its own accord, and loses the power of solidifying; this can be prevented by adding from one to two per cent. of salicylic acid, or of thymol, dissolved in five cub. cents. of alcohol for every one hundred cub. cents. of gelatine.

(*b*). Separation of the film from the glass during development, formation of bubbles, protusion of the layer of gelatine over the edge of the glass, production of creases, distortion and tearing of the negative image—all these defects are due to the employment of too soft a gelatine, which does not yield a hard jelly, and absorbs too much water; by using collotype gelatine they may be altogether avoided. The same effects are produced by too long digestion at a high temperature, by nascent putrefaction, with an emulsion containing too much gelatine in proportion to the silver bromide, or with one flowed over the plate too thickly: also when the emulsion contains a considerable amount of gum-arabic. They may be cured by cleaning the glass plates with a weak solution (1:200) of soluble glass, which causes the gelatine to adhere more firmly; coating the edges of the plate with a varnish of caoutchouc is also a remedy. A complete and radical cure is obtained by, previous to developing, dipping the plates for about five minutes in a solution (a cold concentrated solution may be used) of alum or chrome-alum in water, followed by thorough rinsing; by this process the film is tanned, and in that condition it resists the action of water and of the solutions to which it is exposed. According to Chardon* it suffices to dip the defective plates into alcohol before developing, to let them soak in diluted alcohol, and only to develop afterwards. After developing they are rinsed, dipped in a five per cent. solution of alum, and again washed, and then plunged into the fixing bath. It is worthy of note that the films that have been tanned with alum will frequently develop and become fixed slower than before being tanned.

(*c*). When the silver bromide emulsion exhibits a coarse grain which can be seen on the plate with the naked eye, both before and after fixing, there is no possible remedy. The defect is due to too long a digestion, or to one at too high a temperature, or perhaps to too free treatment with caustic ammonia, which causes the finely-divided silver bromide to coalesce into larger particles, especially when there is not an excess of soluble bromide present.

(*d*). Light-coloured spots without any sharp outline in the negative may be attributed to some fatty substance in the gelatine; they disappear on adding ammonia. A good collotype gelatine does not show this defect.

(*e*). As regards fogging, a red veil always makes its appearance when the emulsion is prepared with an excess of silver nitrate; in commercial emulsion, however, this defect is scarcely ever noticed. According to Chardon† this phenomenon may be observed when the solution of bromine salt is poured into that of gelatine, instead of *vice versâ*; in this case, deleterious compounds are formed of the silver nitrate with the gelatine or other organic substances. Many kinds of gelatine are liable to give fog when they have an alkaline reaction. Fogging is also caused by continuous digesting at too high a temperature, particularly when the emulsion does not contain sufficient excess of bromide; by the addition of too much caustic ammonia, as in Monckhoven's process, or by too long or too great heating with the same substance; also by incipient putrefaction. It may be cured sometimes by adding bromide of potassium or ammonium, and radically by a few drops of the tincture of iodine; but all these measures must be employed with the very greatest care, for a drop too much may almost entirely deprive the emulsion of its sensitiveness. When the plates take a long time to dry (for instance, when they are not dry at the end of from three to six days) they are very liable to fog. Emulsions which are inclined to exhibit a veil are very difficult to correct. Perhaps the best thing to do with them is to work them up for silver residue; this may be done by heating the emulsion with caustic potash and a little grape sugar, when metallic silver separates and is deposited from the solution.

(*f*). Mildew on the plates occurs only in damp places, and not even then when the emulsion has received the addition of an antiseptic, such as salicylic acid. Plates which have been kept for a long time in a damp place are generally subject to fogging, and lose their sensitiveness.

(*To be continued.*)

* S. Chardon, Photographie par emulsion sensible. Bromure d'argent et gelatine, *Paris*, 1880, p. 55.

† S. Chardon, p. cit., p. 55.

THE ARTOTYPE PROCESS.*

Substratum.—No. 1 Solution.

Pure albumen	5 ounces
Bichromate of ammonium ...	25 grains

Add the bichromate, and beat all to a froth, and let it stand over night, and then neutrilize the acid bichromate with a few drops of ammonia, and filter several times. Apply with a brush, and dry by slow heat or spontaneously, and exdose the glass side to the light on a black cloth till a piece of silvered paper turns black; then put in the dark, for use when wanted.

Or the following substitute may be used:

No. 1 Solution.

Albumen	2 ounces
Silicate of soda	1 ounce
Gelatine	60 grains
Bichromate of potash	40 ,,
Water	20 ounces

To the prepared albumen, 2 ounces, add five ounces of water. Now add 5 ounces of water to the silicate of soda, and mix them, pouring the soda into the albumen, stirring slowly all the time. Now add the gelatine and bichromate of potash to the remaining 10 ounces of water, and dissolve by heat in a water-bath, being careful not to raise the heat above 120°. Then add the albumen and soda, mixing thoroughly. Filter, and flow the plates, and set away to dry spontaneously, free from dust. When about to use, immerse the plate in a dish of water about five minutes, then rinse and dry.

Now place in the oven and heat to 100°; then take the plate on the spread left hand, and coat with

No. 2 Solution.

Gelatine	1 ounce
Bichromate of potash	70 grains
Water	20 ounces

In winter from 10 to 20 drops of glycerine may be used. Soak the gelatine in 10 ounces of water for an hour, then add the remaining 10 ounces of water and the bichromate of potash. Heat to a 100°, stirring till dissolved; then filter several times, and it is ready for coating the plates. When warmed to 100°, the plates will dry in ten to twenty minutes. Then cool off slowly, and they are ready for

No. 3 Solution.

Gelatine	1 ounce
Russian isinglass	$\frac{3}{4}$,,
Water	24 ounces
Alcohol	4 ,,
Bichromate of ammonium	90 to 120 grains
Calcined magnesium ...	10 to 20 ,,
Chrom-alum solution ...	1 to 2 drachms

Dissolve the isinglass in 6 ounces of water by boiling from one to two hours, and the gelatine in 8 ounces of water, in water-bath at 100°, and add the alcohol and remaining

* These revelations come to us, says the Editor of our Philadelphia contemporary, as the confessions of a licensee of the Artotype Company.—Ed.

chemicals to the remaining 10 ounces of water, except the chrom-alum solution, which should be added last and on the day of use only. Do not raise the heat in any case above 120° with solution No. 3. Coat the plate precisely as with No. 2, except that the solution should flow off the opposite corner. Let the plates stand for a few hours after they are removed frm the oven, and then expose under the negative to diffused light the proper times.

Chrom-alum Solution.

Chrom-alum	40 grains
Bicharbonate of potash	20 ,,
Water	5 ounces.

Correspondence.

ALBUMENIZING PAPER.

Sir,—Do you think it pays to albumenize your own paper, as you describe in the "At Home" this week? I am very much worried with my prints, and I do not think it is the washing. I wash all night, and change the water several times. My paper is the best Saxe.—Your obedient servant, W. W. R.

April 10th, 1880.

[It pays Mr. England, but then you may not have so much printing to do. It would hardly be worth while to albumenize unless you consume a large quantity of paper annually. Mr. England employs nothing but Saxe paper. —Ed. P. N.]

MANIFOLD COPYING.

Sir,—Do you know the Imperial tablet for copying letters and drawings? I think the original writing is done with a blue ink, and you press this writing upon the tablet. Afterwards you can get fifty or sixty good copies from the tablet by printing off. Can you tell me how to make the tablet? I think there is gelatine in it, but I do not know quite how to go to work. Any hint would be useful. I suppose there is no patent.—Yours, &c., Tyro.

Reigate, 13th April, 1880.

[We cannot give you the formula for making the particular copying compound you allude to, but there is very little variation in them all. We have employed with good effect the mixture which has already been detailed in the News, and if you write with a quill pen on ordinary paper with some of Judson's violet, you should get fifty or sixty good copies.

Glycerine	... 16 parts
Glue, best Salisbury ...	... 4 ,,
Sulphate of baryta	... 6 ,,

See that your baryta is well powdered, and wash it thoroughly before use. The glue must be of good quality, costing about one shilling per pound; it is soaked in cold water for twelve hours, and then dissolved by warmth, and the glycerine and baryta added. It is best to filter in a water bath through flannel, to keep the mixture fluid, and you then run it into a shallow tray of metal or cardboard. If there are any bubbles on the surface of the cake when set, wash with a warm sponge. You simply press your writing (when dry) in contact, and after a little gentle rubbing pull off the paper again. Printing off consists simply in pressing paper upon the cake and pulling it off again. The writing should be removed from the tablet, as soon as possible after use, with a sponge, warm water, and elbow grease.—Ed. P. N.]

ACCIDENTAL FIRE FROM A LENS.

Sir,—An accidental conflagration caused by a lens, such as you allude to in the Photographic News of this day, occurred in my studio at Lincoln many years ago, and did considerable damage.—Your obedient servant,

Putney, 10th April, 1880. J. W. D.

EMULSIFYING IN WEAK GELATINE SOLUTION.

Sir,—I have been preparing my own gelatine plates after Mr. Bennett's formula, for the last seven or eight months, with a fair amount of success, but lately seeing a method described of emulsifying in a weak solution of gelatine, boiling for about ten minutes, and when cooled down to a moderate temperature adding remainder of gelatine, I tried that method, and the first batch of plates were a great success, being very rapid, brilliant, and quite free from any kind of fog. I have since prepared three separate batches, following same instructions with great care, but cannot get same result. The plates look all right until the developer has been on them for some time, and then, on looking through the negative, a peculiar kind of fog will be seen to have set in, which appears to commence from the back of the film, as though the fog arose between the glass and film; it commences in the shadows and gradually spreads over the whole negative, and, before development should be complete, has become a thick dense fog. The only plan I can find to cure the plates is to use a large quantity of bromide in the developer; negatives can then be got free from fog, but the exposure must then be lengthened to about half, instead of one-tenth the exposure of an ordinary wet plate. Can you or any reader suggest cause of failure, or in any way help me out of the difficulty? If so, I shall be much obliged. I am convinced the fog does not arise from light getting to emulsion or plate. The formula is as follows:—

Gelatine	10 grains
Bromide	120 ,,
Silver	200 ,,
Water	10 ounces

After emulsifying and washing, add 400 grains of gelatine.—Yours, &c., E. R. Gyde.

Aberystwith, 7th April, 1880.

PAYMENT OF ASSISTANTS.

Sir,—I hope you will excuse the liberty, but I want to know what you think are fair wages for an operator. I have been six years now accustomed to working, and thirty shillings is all I get (per week?) Do you think this is enough. I can coat plates and develop them, and do everything handy. I have not retouched much, but I can soon learn it, and also print and tone very well. I should like to know what you think, sir, and should be much obliged.—Yours respectfully,

An Operator of Six Years' Standing.

[We do not like the term of "Operator," and if we had our way, we should taboo it altogether. We would certainly advise our friend to learn something of retouching, and when he can take a good negative, and make the most of a bad one, he will be worth more than he now receives.—Ed. *P. N.*]

Proceedings of Societies.

Bolton Photographic Society.

The ordinary monthly meeting of this Society was held at the Baths, on the evening of Tuesday, the 6th inst., Mr. R. Harwood in the chair.

The usual formal business of the Society having been transacted,

The Secretary exhibited a new water-proof focussing cloth, and a quantity of views from Miller's Dale. The remainder of the evening was occupied by a lantern exhibition, by Mr. Shipperbottom, who placed a number of transparencies upon the screen taken by himself, and also a series from the collection of Mr. Harwood.

The meeting finally closed about 10 p.m.

Photographic Society of Ireland.

The monthly meeting of this Society was held on Friday, the 9th inst., in the Royal College of Science, Stephen's Green

East, and took the form of a lantern exhibition, to which members had the privilege of inviting their friends.

The chair was taken at 8 o'clock by the President, Dr. J. Emerson Reynolds, who, having shortly reviewed the history of the lantern, announced the programme of the evening, drawing attention to the fact that the first part of the exhibition would consist of views entirely the work of members of the society. This portion having been gone through and fully appreciated, judging by the satisfaction which each well-known view seemed to afford to the very large audience which had assembled, a large and varied collection of very fine slides were further exhibited and much applauded.

A vote of thanks was unanimously passed to the Vice-President, Mr. Howard Grubb, for the use of his splendid pair of lanterns; to the Science and Art Department, for having placed the Lecture Theatre at the disposal of the Society for the evening; and to those members to whose exertions the success of the entertainment was undoubtedly to be attributed.

The proceedings then terminated, many of the visitors expressing a hope that they would be again afforded the opportunity of enjoying a similar exhibition.

Talk in the Studio.

Theories of Light and Colour.—A good deal regarding light was known to the ancients. They knew the law of reflection and something of that of refraction, as shown by the reference of Seneca to the broken appearance of an oar when thrust into the water. Another phenomenon, that of the rainbow, standing out in the sky as a sort of challenge to the human eye, could not escape detection. At one particular angle, as shown by Descartes, beams reflected by or emerging from a drop of rain were so welded together as to form a condensed sheath of rays, and it was in this condensed sheath that you saw the colours of the rainbow. Milton, in 1672, proved by the use of the prism, acted on by a beam of light thrown through an aperture in a window-shutter into a dark room, that white light is not homogenal, but is composed of various constituents more or less refrangible, of which red is the least and violet the most refrangible. This premised, Professor Tyndall, by a series of beautiful and interesting experiments from apparatus managed by his assistant, threw upon a white screen discs of several colours in order to prove the true effect of intermixture. Thus the ordinarily received theory that combination of yellow and blue produces green was shown to be erroneous, the true effect of the combination of those two colours being, as proved to ocular demonstration, white. By the same means the true complementary colours were displayed. Fixing the eye on a white disc until the lecturer counted twenty and the special illumination of the disc was withdrawn, the spectator saw remaining the filmy semblance of the complementary colour, black. Blue left orange, red left green.—*Professor Tyndall at the Royal Institution.*

Dark Lines in the Solar Spectrum on the Less Refrangible Side of G. By J. C. Draper.—The author refers to a former paper on this subject (*Am. J. Sci.*, 16). He now discusses the region of the solar spectrum between λ 4316 and λ 4320 of Angström's scale. Five photographs, taken in November 1878, and January and February 1879, show faint lines in this region which agree in position with lines in the electric spectrum of oxygen. Similar lines are visible in Rutherfurd's photograph of the same region, and in Christie's map of the prismatic spectrum. A diagram is given showing the coincidence of the lines noticed by these three observers, with the lines in the oxygen spectrum as observed by Angström, Draper, Plücker, and Huggins. A table is also given of the solar lines between λ 4313 and λ 4325, in which all the lines corresponding with those of known elements are marked. The author considers (1) that the regions in the solar spectrum at λ 4317 and λ 4319, claimed as bright lines of oxygen, are not as bright as others in their immediate vicinity; (2) that the solar spectrum shows faint dark lines in the region about λ 4317 and λ 4319; (3) oxygen is the substance which can produce dark lines in this region; therefore we must attribute them to the presence and action of that element.—*Journal of Chemical Society.*

To Correspondents.

Gordon.—Tungstate of soda is frequently used in the toning bath. A very good formula is:—

Tungstate of soda	20 grains
Chloride of gold	1 grain
Boiling water	6 to 8 ounces

It may be used at once—or, rather, as soon as it has cooled.

J. B.—Never, unless you wash. Unwashed silver paper won't keep.

Gelatino.—You must wash your plates thoroughly before applying the intensifier; you will find that Mr. England lays great stress on this in his directions.

Enamel.—Mr. Solomon, of Red Lion Square, has issued a little book on the subject. Why not apply to Mr. Henderson, as you suggest?

J. O'Brien.—You mean the *Bulletin de la Societe Francaise.* This is the official organ of the French Society. The *Moniteur* is another paper altogether.

Isis.—Both in St. Petersburg and in Ghent.

J. W. D.—You do not enclose your card or give your name, which should always accompany letters for publication. You are quite right in your assumption; the gentleman is a well-known violinist, and has published the works you mention.

The Rev. B. T. Thompson and Gamma.—We are happy to give you the proportions of Dr. Eder's oxalate developer in British weights and measures as nearly as we can without going into decimals.

Solution A.

Neutral oxalate of potash	4,030 grains
Water	35 fluid ounces

Solution B.

Sulphate of iron	1,550 grains
Water	11 fluid ounces
Sulphuric acid	2 to 4 drops

The two solutions *A* and *B* are kept in stock, and mixed in the proportion of three volumes of *A* to one of *B* for developing.

X. X. X.—We do not know if the *anti-argentine* is to be purchased in this country, but any importing chemist would doubtless get it for you. Do you need it, however? There is very little difficulty about taking silver stains out of linen. Dissolve a few grains of iodide of potassium in water, and put a few crystals of iodine into the solution. Rub this into the fabric, and then treat it with a solution of hyposulphite of soda. Finally, wash.

Albert Feron.—Perhaps you allow your emulsion to go much above boiling heat; a very high temperature or long continued boiling decomposes the gelatine. The opinions are still divided on the question of actual boiling, as you will see by "Topic" this week. 2. Plates are dried in the way you mention, but we have no very firm faith in the method. Captain Abney and Mr. William Bedford will shortly give you the benefit of their experience on the subject in these columns.

Photophilus.—The conclusion we come to is that your arrangement would be suitable for photographing liquids, and the new method of testing oils by the shape assumed by a drop of oil on a surface of water might make your method of value. Again, as the liquid would be facing the sky you get an ample supply of light, and this advantage might induce one to try the plan for copying drawings, &c. Photo-lithographers and others who do this sort of work, by employing plumb-line and spirit level, manage, however, very well. There is no reason for the condenser E at all, since you do not want to form a secondary image J, the mirror B would do all that is necessary. It is a question, too, in our mind, whether it would not be better to attach the mirror to the lens at an angle, as the carbon photographer does, when he wants a reversed negative for single transfer, rather than have the reflecting medium depending from the roof.

A. P. C.—You will see the information you require in this column. We should rather prefer the formula we give to the one you mention.

R. Parr.—The lecture will appear next week. It is, of course, the ferrous sulphate salt, as you suppose.

J. H.—Try process given by Abney in News of the 27th Feb. for printing by development; or that brought before the Photographic Society by Monckhoven in 1869.

Opal.—Your prints show a trace of hyposulphite on testing, but how it got there we cannot, of course, divine, as you say they were all carefully tended. A strong soda or potash solution should effectually clean your plates, and if you albumenise that is one precaution the more. We prefer developing in a dish, as the action is more uniform. Tone with

Bichl. iridium et potass. sat. sol.	1 drachm
Water	10 ounces
Gold	1 grain

Transparency after fixing to be well washed. Toning to be carried on until both sides of film are alike.

The Photographic News, April 23, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Celloidin—Edwards' Form of Alkaline Developer—Proportion of Different Rays in Different Sources of Light—A Singular Instantaneous Process.

Celloidin.—The Editor, or one of his staff, called attention to celloidin in the last issue of the News, and we have a word to say in its behalf. It is perhaps the very best form of pyroxyline that has been introduced. For making collodion emulsion, Mr. William Brooks has given it an excellent character, which we can fully indorse. It is absolutely free from specks of any description when dried, and gives a beautiful film, capable of giving the tenderest half-tones, and, above all, the latent image—or, as we believe it is considered to be more correct to say, the undeveloped image—is not liable to fade away if the plates be not developed. Mr. Brooks gives an account of plates keeping three months after travelling over the Continent, and then developing with ease, and without loss of detail. In ordinary pyroxylines there are, no doubt, various impurities, and Schering says in his description of celloidin that these impurities—such as dextrine, xyloidine, nitro-mannite—are eliminated by his process of manufacture. Whether this is the case we do not know, but of one thing we are quite certain, and that is that it is a very beautiful preparation, and quite worthy of trial by practical photographers who may still work the dry or wet collodion processes. Celloidin is pyroxyline in cakes, containing 20 per cent. of the pyroxyline; the remainder consisting of semi-evaporated solvents. The necessity for this mode of preparation arose through the German Government absolutely prohibiting the carriage of any form of gun-cotton by rail, and hence the form in which celloidin is prepared. There is another advantage in it also, and that is that it is not at all liable to decompose spontaneously, as is pyroxyline, since it is presumably dissolved immediately after manufacture, and if this precaution be taken there is absolutely no danger of the cotton undergoing any change. It need scarcely be said that Schering is one of the best known German manufacturing chemists, and his name is a sufficient guarantee for its excellence.

Edwards' Form of Alkaline Developer.—The latest improvement in the alkaline developer is due to Mr. B. J. Edwards, and, as will be seen by reference to last week's News, consists essentially of the addition of glycerine to both the ammonia and also to the pyrogallic acid solutions. Now we work gelatine plates, and have always fought rather shy of the ordinary alkaline method, on account of its staining action on the film, and, like our Editor, rather swore by the ferrous-oxalate developer. Well, we have given the new developer a trial, and, so far, are enchanted with it. It flows over the gelatine film with the greatest ease, and, in fact, it is scarcely necessary to use a dish for the operation of developing, since there seems to be no repellent action. The image comes up rapidly and beautifully, and takes density with great readiness. Since trying it, we have almost parted from our old love, the iron developer, as the latter has one disadvantage, which is the liability to form streaks of oxalate of lime in the film, through the chalk present in the ordinary washing water, but which can be removed by the action of very dilute hydrochloric acid, or, as Mr. Warnerke recommends, by citrate of soda. Neither of these chemicals is absolutely without danger to the film, and hence our disinclination to use them. In collodion emulsion films the same danger is not to be apprehended, and we usually give them a wash of hydrochloric acid after fixing and washing, to get rid of these markings, and also to dissolve out any minute particles of the iron salt which may be precipitated in the pores of the collodion. Photographers cannot do wrong in trying the modified developer, and those who can do so should report their candid opinion regarding it, as we do ours.

Proportion of Different Rays in Different Sources of Light.—Herr Mayer, in the *Photographisches Wochenblatt*, gives a number of comparisons made between the different rays of the spectrum given by sunlight, ordinary skylight, gaslight, and the electric light. He finds that, comparing the electric light and the sunlight together, the former has more yellow light in proportion to the blue than the latter—in other words, the electric light is yellower. At first blush this seems hard to believe, since the electric light always looks so violet-tinted, but it must be recollected that the comparisons are usually made between candle or gaslight and sunlight, and not with daylight, since the electric light is rarely worked except when sunlight has gone. Perhaps the readiest mode of showing the yellowness of the electric light is to cut a hole in a piece of card, place a white screen behind it, and direct a beam of sunlight through the opening in one direction, and of the electric light in another, so as to get the images of the holes always side by side. An examination of the two will at once show that there is a prominent yellowness in the electric light as compared with that from the sun. The difference is, however, only apparent in really bright weather. In the winter time, when the sun is low in the horizon, and when there is usually a good deal of watery vapour in the atmosphere, the tables are turned; whilst in a fog daylight looks absolutely yellow when compared with gaslight. The electric light for the studio is always a sure gain to the photographer, though it must be admitted that the tax he pays for it is rather heavy. Still it *is* an advantage, and we shall be surprised if it is not soon found in many of the first-class studios. There is no patent that can stop its application, since no principle can be patented. We have seen most excellent portraits taken by its means by amateurs, the light being softened by means of tissue paper, which takes away the unpleasant glare so often felt when the eyes are directly illuminated by it. Our American cousins have introduced what is, perhaps, the steadiest light. The Brush machine is beautifully constant in its action, and the lamps they have adapted to it are admirably steady, there being none of that disagreeable flickering which seems inherent in some lamps. The day will probably soon arrive when a simple application of water power from the service mains will suffice to drive the machine without any expenditure of steam power. A telephone will then be sufficient for the photographer to signal his assistant to turn on the water tap, and the light will instantly be shown. Where we have seen the electric light at work it has generally been necessary to have a gas engine, or other such motive power, and this is a nuisance to a photographer who is not a mechanician, and if it can but be done away with, the never-failing light will be found where at present it can only be dreamt of.

A Singular Instantaneous Process.—It was lately pointed out to us that an entirely new process had been introduced whereby moving objects, such as children and dogs, could be photographed without difficulty. Singularly enough, the *locale* of the process is in Yorkshire, and presumably must have been discovered by one of the tykes that live in that northern county. The description of it—or rather, we should say, the advertisement of its merits—is rather baffling, as it is simply said that it was "our instantaneous ferrous oxalate process," and Yorkshire was asked to try it. What it means is a little past understanding, unless it means that it is the gelatino-bromide process under another name. If it be so, the description of it is worthy of our very occasional correspondent, Mr. J. L. Toole, and might be, with advantage, amalgamated with his "sesqui-quæ-quod," which forms such an important part of his lecture on photography.

At Home.

MR. FRANCIS BEDFORD AT CAMDEN ROAD.

Eighteen years ago, shortly after the death of the Prince Consort, his Royal Highness the Prince of Wales started on a journey to the Holy Land. The tour had been projected by Prince Albert, who traced it out with much care and forethought, the spots to be visited being such as he desired to impress particularly upon his son's mind as being likely to educate and interest the future King of England; and after her husband's death, her Majesty did not hesitate to carry out the project. The party selected to accompany the Prince was small, but well chosen. It included General Bruce, who was to be a sort of commander-in-chief of the party, Col. Teesdale, Col. Keppel, the Hon. Robert Meade, a college friend of the Prince, a physician in the person of Dr. Minter, and Dr. Stauley, the present Dean of Westminster. As this modern crusade was on the eve of starting, there came a hasty command from Osborne decreeing a further addition to the party; Mr. Francis Bedford was sent for by the Queen, and, after a few preliminaries, was introduced to the Prince of Wales as an extra travelling companion.

It is pleasant, even after this lapse of time, to listen to Mr. Bedford's reminiscences of this right Royal tour. They journeyed straight to the Mediterranean, where H.M.S. *Osborne* was waiting to convey them into the Levant; they boated on the Nile, wandered over Palestine to Jerusalem, and visited the relics of the Holy Land. The young Prince was affability itself, and the life and soul of the party. At Hebron, the Prince asked Mr. Bedford to remain behind to take certain photographs, and insisted on our friend being provided with a guard of fifty soldiers to keep him and his apparatus from harm. A series of 210 plates were secured by Mr. Bedford on this tour, and of these 175 were subsequently selected for publication, the Prince good-naturedly permitting Mr. Bedford to do pretty well as he pleased with them. But perhaps the best proof of the good terms on which prince and photographer travelled was afforded some years afterwards at Pall Mall, when the Prince of Wales, busy inspecting the pictures on the walls, suddenly turned round and said, "But where is Mr. Bedford? I don't see Mr. Bedford." That gentleman, however, was at the prince's elbow, and the cordial manner in which Mr. Bedford was received at once showed that His Highness still remembered vividly the pleasures of the tour they made in company.

The bright landscape pictures of Mr. Francis Bedford, and of his not less talented son, Mr. William Bedford, require no commendation in these columns. In the same way as Mr. England appears to enjoy a sort of monopoly in Continental pictures, so the Messrs. Bedford stand pre-eminent in reproducing the soft landscapes and craggy headlands of our own country. Here is a trough a dozen feet long, in which many hundreds of pictures of English scenery are washing, the moving water bringing them into view one after another. The prints are small, none larger than whole plate size, and many of them for the stereoscope; but they are all alike in this: they are sharp and vivid, but so soft and delicate withal, that they look like exquisite engravings. "There is Exeter Cathedral," we say, "and that is the Valley of Rocks, and that is Lynmouth, with its big rocks and wave-beaten wall; what a charming coast picture!" The last photograph is a favourite with Mr. Bedford, for it can never be taken again; they have improved the place and carried away those big frowning rocks by the causeway, he tells us.

As a large publisher of pictures, Mr. Francis Bedford has paid great attention to the question of permanency in silver prints. He will have nothing to do with paper sensitized out of England, and he is particularly careful to wash well. This is his plan: after toning and fixing, the prints are thrown into water, and an assistant, agitating them one by one by hand to free them as much as possible from the hyposulphite, passes them into a series of troughs. Into the first of this series of troughs falls a fast running stream of water which overflows into the second trough, and from this into the third, and so on. The assistant washes his prints up the stream, which may be likened to that in the fable of "The Wolf and the Lamb," progressing from one trough to another until the prints arrive at the source. They are now taken out and put into the large washing trough, where they remain for something like eighteen hours. The trough has a false bottom of lattice-work, on which the prints rest—if they may be said to rest at all—and under this lattice-work is a serpentine tube through which, in winter time, passes hot water, so that the washing is kept at a tepid temperature. Like Mr. England, Mr. Bedford employs a little water-wheel, but he applies its motive power differently. When this water-wheel revolves, which it does about once a minute, from its buckets becoming filled, it naturally makes a revolution, and, so doing, turns a crank; this crank causes a sort of flapper to work to and fro in the water, which is thus vigorously stirred and agitates the prints. Moreover, there is a long arm or lever in the water, to the end of which is attached a float; so long as there is plenty of water the float swims and the lever does not act, but should the extreme end of the lever sink for lack of water, the other end rises and at once checks the water-wheel, when the supply of water flows into the trough uninterruptedly until the float (at the end of the lever) rises again.

Next in importance to his washing arrangements, the plan adopted by Mr. Bedford to collect residues calls for notice. Not less than 75 per cent. of the silver expended in printing is got back again at Mr. Bedford's establishment, a fact we would impress upon our readers with particular earnestness. Economy is frequently pushed to the extreme in studios in the matter of purchases, while the saving of residues is deemed a matter of secondary importance. From his hyposulphite solutions, Mr. Bedford estimates that he recovers half as much silver as from the first washing waters, a circumstance, we are sure, that will cause surprise to many photographers. The plan adopted to recover the silver from the washing of prints is exceedingly simple, effective, and very easily explained. The three first wash-waters are supposed to contain all the silver salt that is worth collecting, and these are poured down a sink in one corner of the apartment; in the next room is a rubber tube connected with this sink, and here, too, are three big earthenware pans, each of them of 60 gallon capacity, embedded in sawdust for protection against frost and injury. The rubber tube permits these pans to be filled one after another. When No. 1 is full, hydrochloric acid is added, and the liquid permitted to stand; No. 2 is next filled, and in its turn No. 3. By this time the chloride of silver in No. 1 has been precipitated; the clear liquid is drawn off, and the pan, which is pivoted at the bottom, may be relieved of its precipitate, or refilled with washings by means of the tube. The precipitate is filtered through flannel, dried, and then sent to the refiners; the converting of the mass again into nitrate is wisely left to the manufacturing chemist.

In the sensitizing room of Mr. Bedford's establishment—which, by the way, is exceedingly compact and complete—are facilities for exciting and drying 120 sheets of paper at a time. Four huge baths of nitrate of silver are ranged in a row on a low dresser, and by the time an assistant has floated a sheet on the fourth, the first is ready to lift up and put over the drying rod. A long trough upon wheels is placed under the wet sheets to receive the droppings of the precious liquid, the trough being moved along as every fresh row of sheets is added.

Most of the printing is conducted under glass, a linen screen being pulled across overhead if the sun begins to shine, for the sashes above are otherwise found to leave

eir mark on the delicate pictures. Every negative is lged with black paint, for the double purpose of giving e prints a white margin—especially agreeable in the case ' unmounted prints, and Mr. Bedford issues all in this ndition—and to economise the toning bath. The deep ack edges in an ordiuary print, Mr. Bedford avows, run vay with as much gold as the picture itself. Finally, the iinting of the margin facilitates the marking of the egative with its number.

The cracking of the negative film is rarely seen now, id this is attributed by our host to the circumstance that ie collodion is better than it used to be. It is the latter, id not the varnish, that is at fault. Mr. Bedford has had egatives closely packed together, and almost unused, hich on unpacking have shown defects of this nature, hile others freely stacked in boxes have exhibited nothing f the kind.

An ingenious method of improving the skies in negatives id softening the horizon line, and perhaps adding detail a foreground, is adopted by Mr. Bedford. His former lan, as many of our readers know, was to cover certain ortions of the negative with tracing paper, and work with encil, stump, or brush upon this. Tracing paper, however, ets yellow and opaque in time, and in any case shows a ery decided outline. But by grinding the reverse face f the negative—Mr. Bedford, like a careful photographer, lways employs patent plate—by means of a glass muller nd emery powder, a surface is secured upon which work f any description can be done. A few free strokes with brush dipped in Indiau ink, or with a pencil, add freuently to the value of a negative, while the mere grinding f the glass behind the horizon line, whether sea or ridge f hills, tends to soften this portion of the plate considerbly. In a word, there are very few photographers who ake such extreme care over their printing as the Messrs. edford.

The "At Home" for next week will be "Messrs. W. and . Downey at Ebury Street."

RINCIPLES OF OPTICS INVOLVED IN LANTERN CONSTRUCTION; AND ON A NEW ENLARGING LENS, ESPECIALLY DESIGNED FOR USE WITH THE MAGIC LANTERN.

BY J. H. DALLMEYER, F.R.A.S., ETC.*

'o photography must be assigned a considerable share in proaring an enlarged field of usefulness for the lantern—the inrument said to have been invented so long ago as the iirteenth century, by Roger Bacon. It is no longer the toy, s in bygone ages, for the raising of spectres, &c., but is daily aining in favour with the public lecturer, who has discovered it a ready means for the diffusion of knowledge. However, ven in its present state it leaves much to be desired, for who as not witnessed tl e of'en contorted and ill-defined pictures rown upon the screeu?

The practical application of the law of conjugate foci constiites the principle of lantern construction, viz., the object or ide to be enlarged is placed in oue of the conjugate foci of the ns, and the image or screen in the other; thus, for a larger nage, the screen must be removed to a greater distance from, id the slide brought nearer to, the lens, and *vice versa*.

To obtain an enlarged picture of sufficient brilliancy, a lantern mprises three essential elements, viz.:—

1. A brilliant source of light.

The illumination of the picture diminishes in the proportion ' the square of the distance of screen or the size of enlargeient; thus, if at distance 1 the illumination equals 1 candle, ien at distance 50 it is only $\frac{1}{2500}$ of that amount; in other ords, if at distance 50 the picture is to appear as bright as it is t distance 1, we require 2,500 candles in place of 1 for the ource of light. A case in point when a 3-inch picture is enirged to 12 feet by means of a 6-inch focus lens, *without* a ondenser.

* Read before the Photographic Society of Great Britain.

2. A condenser to concentrate this light upon the picture or slide.

3. The lantern "front," or objective, to project an enlarged image upon the screen.

Years ago my attention was called to the necessity for a better lantern-lens or objective, by one well known in the annals of photography. I refer to Mr. Latimer Clarke, the inventor of a stereoscopic camera known by his name, who employed the lantern for the purpose of amusing and instructing his children. I well remember being struck by the ingenuity of this gentleman in providing a plaster of Paris screen, made concave, to suit the curvature of image produced by his lens. Though successful, the dimensions of such a screen were necessarily limited; and hence his request for a better lens to project a well-defined image upon a flat screen of larger dimensions.

The problem presented for solution is by no means an easy one, and had it not been for a further incentive to the same end by another gentleman, still better known in photographic annals—the Rev. F. Hardwich, formerly Professor of Photographic Chemistry at King's College, the subject would, probably, have remained in abeyance; at least as far as I am concerned. The reverend gentleman, as far back as the year 1876, wrote me a first letter urging the importance of an improved lantern for public lecturers. In subsequent letters, in response to my application, he kindly furnished me with all the *desiderata*; and this has enabled me to complete my task.

I think I shall best meet the wishes of my audience if I give some of the valuable hints obtained, in Mr. Hardwich's own words, arranged under three heads.

First—The source of light, or the *radiant*, as I shall term it. "The process I use is the oxy-hydrogen or mixed gases; the perforation of the lime which shows the greatest intensity is about the size of a split pea. Then there is an outer circle of less luminosity, &c. I do not like to risk anything nearer than $2\frac{1}{2}$ in. to 3 in., if the thickness of the glass is considerable.

"I never had a fracture, but I take precautions, for the sake of the lime cylinders as well as the condenser. First, I turn on the hydrogen only, for three or four minutes, then enough oxygen to make the flame burn red, for another three or four minutes; and after that the full amount of oxygen required for incandescence."

Second.—The Condenser. "The one I use does not bring the whole of the light to a focus. The lighted disc should be as white as possible. Quantity as well as quality of light is wanted in a new condenser. I have obtained the best results from the American or symmetrical condenser of 4 in. diameter and 2 in. solar focus (3 in. equivalent), but I fully expect that you will go beyond it."

Third.—The Lens, or Objective. "For lecture halls, a 6 in. (equivalent focus) is a good size. The field should be flat, or nearly so. The practical point is a brilliantly lighted picture of great size. A 3 in. should be enlarged to, say, 12 feet. "I cannot get beyond $8\frac{1}{2}$ feet; enlarged beyond that the pictures are not brilliant, especially at the edges, &c., &c. I noticed that in showing a spectrum on the screen to illustrate the rainbow, the blue appeared green, and all the upper violet shades were destroyed."

Mr. Hardwich then recounts the difficulty experienced by him in procuring a good French lens, remarking that all the quarter-plate lenses sent to him to choose from were defective in flatness of field, the outsides being quite out of focus. He then became possessed of a half-plate French lens, which gave a flat field, and admitted of much more latitude in the adjustment of the lime. An alteration in its position, further from, or nearer to, higher or lower, not sensibly affecting the disc, as compared with the quarter-plate lenses referred to. Tested for distortion upon a square border, it proved to be of the hourglass description, and the picture looked as though it were projected upon a slightly concave surface. He then refers to the advice so often given, viz., "to pick out a French lens with a flat field," concluding, "and *that* is precisely the weak point, as far as my experience goes."

With this ample summary of requirements before you, I proceed to make a few remarks in the same order.

First, the source of light, or radiant. Theoretically, this should be a *point*—at any rate, it should be as small as possible, but intensely white or luminous. The nearest approach to such a source is the lime-light, or the oxy-hydrogen light, referred to above; but even this is not a point. How much inferior, then, are the various kinds of lamps or lamp-flames used for the

purpose! I say nothing about the convenience or even sufficiency of such appliances for the illumination of small screens in private rooms, for they are undoubtedly safe. I am here concerned with the *best* source of light or radiant, and until electricity—the light of the future—is brought to our aid, the lime-light must be considered the best. I do not touch upon the subject of the proper methods for the production of this light, such as the preparation and storing of the gases, the best

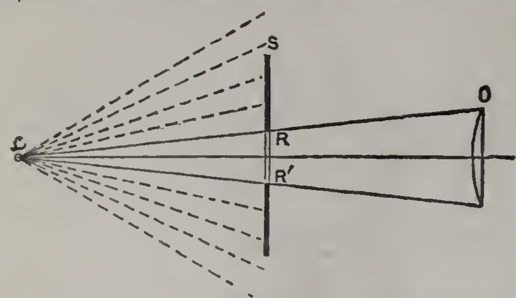


Fig. 1.

lime cylinders, the safety jets, &c., with which I am not practically concerned. Moreover, I prefer to leave this part of the subject in abler hands, such as Mr. Hardwich's, or other chemists familiar with the matter.

Assuming that we are in possession of the best radiant, we require something more in order to obtain a well-illuminated image upon the screen. Fig. 1 illustrates my meaning.

Let L represent the radiant, which sends out light in *all* directions, the diagram only exhibits 1-6th of these radiations. It illuminates the slide S represented in position, but only that portion of it situated between R and R′, falls upon the objective O; hence that small portion only is feebly illuminated and represented upon the screen. Now contrast the condition of things represented in Fig. 2, drawn to same scale.

Here the entire pencil of rays shown in Fig. 1 is concentrated upon, or illuminates the slide S, by means of the two plano-convex lenses, A and B, the condenser; and the objective O now receives light from every portion of the slide, the whole of the image being brilliantly illuminated upon the screen.

I pass by the single-lens condensers generally supplied with "toy" lanterns, inasmuch as they are almost devoid of correction, and only collect or condense a comparatively small amount of light upon the picture; nor shall I refer to the more complicated forms of condensers composed of three or more single lenses, nor to achromatised (!) ones. Condensers said to collect angular pencils of 90°!

The condenser represented in Fig. 2 is of 4 in. diameter and of 3 in. equivalent focal length, the radiant being at the same distance from the first lens and including an angular pencil of 60°. To collect 90° requires for the same aperture an equivalent focus of little more than 2 in., and when I mention the fact that the lenses composing such a condenser exceed the former

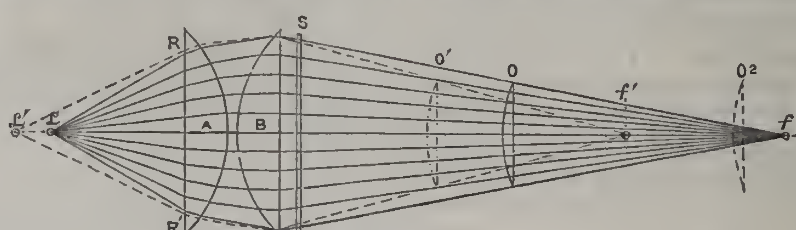


Fig. 2.

by about one-third in thickness, the radiant of necessity occupying a position only removed $1\frac{3}{4}$ in. from the first lens, these conditions are obviously impracticable. Other things being equal, the amount of light collected by condensers is inversely proportional to the squares of their foci.

(*To be continued.*)

THE USE OF SILVER IODIDE IN A GELATINO-BROMIDE EMULSION.

BY CAPT. ABNEY, R.E., F.R.S.*

Though not a believer in the universal merits of gelatino-bromide emulsion, as the Society doubtless knows, yet there is one charm in connection with it, and that is rapidity, and there is great excuse for any one taking up the process on this account alone. I honestly say that the charm of it for me is the charm of experimenting with it, and this I have done since its first introduction, and I now beg to lay before the Society the results of some experiments which I venture to hope may be useful, in that they show how to utilize the rapidity without injuring the sight, by the use of inadequate and unhealthy light in the developing room, or in the preparation of the plates. What can be more miserable than to go into a "gelatine" man's developing room, and see how he fumbles about for this thing and that, and then finally develops his plate almost by a *tour de force*. I hope to show you how that can be avoided by a very simple means, and I do so with the more confidence as a portion of my experiments have been confirmed by a no unworthy labourer in the same field, Mr. W. England. The modification is simplicity itself. Bromide of silver is sensitive well into the red of the spectrum, as is well known, whilst bromo-iodide of silver is not.

A year ago I verbally mentioned to a well-known gelatine plate preparer that a modicum of iodide of silver in the emulsion took off the great sensitiveness to the yellow and red rays; and some six months ago, in a letter I wrote to the Belgian Photographic Society, I described certain experiments therewith. Since that time, at my leisure, I have worked at the process with very definite ideas of what I required, and having found the means of arriving at my requirements, I offer the results of experiment to the Society. I am in a position to say that an emulsion of silver bromo-iodide can be made just as sensitive as the emulsion silver bromide, as regards the ordinary so-called actinic rays, and can be prepared so as to be perfectly unacted upon by the orange or red rays, which is a step in the right direction, according to my way of thinking. If, instead of dissolving soluble bromide in the gelatine previous to precipitating with the silver nitrate, 1-6th part of the quantity of soluble iodide be added, the rays which affect the resulting washed emulsion are nearly those which affect a wet plate; if 1-12th part be used, the compound is sensitive well into the yellow; and if 1-24th be used, the emulsion is slightly sensitive to orange, and a *very* little into the red. To those who use the spectroscope one may speak more definitely. The first is sensitive to the rays above E, the second to the rays above D, and the last to the rays above B, or thereabouts.

Now about sensitiveness: If such salts be emulsified with, say, 1-6th to 1-4th the amount of gelatine to be finally used, and then be boiled for *equal times*, the resulting emulsions will be equally sensitive, and in the first case the development can take place in a room in which the ordinary wet process is worked, always supposing that the glass, or covering of the window, really admits only orange light. With the last two proportions—ruby and orange glass combined—are perfect protections during development, which is more than can be said always when silver bromide alone is used. It is only recently that I have been underkaking comparative experiments, and every emulsion made is actually held in the photo-spectroscope, so that there can be no doubt as to what rays the substance experimented upon is sensitive. There is another great advantage in the use of iodide even in smaller proportions, and that is the great clearness of the shadows, which is often wanting in a gelatine plate. It happened when I was in the midst of my most recent researches in this matter that I visited Mr. England for the purpose of comparing some plates with his, and I found that he also had

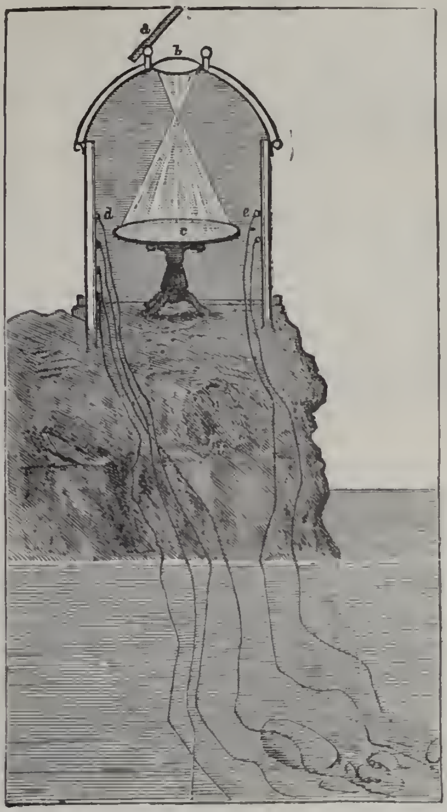
* Read before the Photographic Society of Great Britain.

been experimenting in the same direction, and had arrived at the same conclusion as myself regarding the sensitiveness of the bromo-iodide emulsion, and also its beautiful clearness. I have already indicated the method by which sensitiveness can be obtained, and I believe that I originally pointed out the plan. Boiling the emulsion for half an hour will certainly give, at all events, as great sensitiveness to the plate as is to be found in any plate which I have had an opportunity of trying. It is beyond the scope of my paper to give any formula, as no doubt many which have proved successful in other hands will be perfectly workable by the addition of the iodide. If, however, it should be considered necessary, I shall be happy, on a subsequent occasion, to give the exact formula I employ. I may state that with this method the emulsification by precipitation from an aqueous solution has to be abandoned, since the silver iodide invariably falls in such a form that it is very difficult, if not impossible, to form a smooth emulsion with it. I am almost tempted to give the results of some experiments made in the matter of intensifying gelatine negatives with silver. I believe I have found a plan which can be used without any danger of causing stains, or subsequently causing any inconvenience through change of colour by the action of light; in other words, a plan for obtaining intensity with the same immunity from risk as can be done with a collodion film. I have thought it better, however, to withhold this for a time, so that I may be quite sure that there is no possible source of danger attached to the method. If this is a *fait accompli*, the principal drawback to the use of gelatine emulsions will have vanished, since local intensity can be given to a negative, which is at present impossible.

THE CAMERA AND THE TORPEDO.

One would scarcely expect to find the death-dealing torpedo and harmless camera in close companionship, and yet, strange as it may seem, the one modern invention has helped the other in no important degree. Still, since the torpedo calls to its aid the help of electrician and chemist, there is, after all, perhaps, little to be surprised at in the photographer being invited to assist also. In calculating the energy of modern explosives—gun-cotton, dynamite, litho-fracteur, &c.—the camera has been especially useful. Charges of the same weight of these compounds are sunk under water to the same depth and exploded, when the cone of water thrown into the air at once proclaims whether the action of the submarine charge is great or small. Thus, a hundred pounds of gun-cotton ignited under water throws up a cone or volume of water three or four times as large as one hundred pounds of gunpowder fired under the same circumstances, and the measuring of this cone is effected with the aid of the camera. Certain land-marks, or rather water-marks, are placed first of all on the scene, in order to permit of measurements being taken, and then, at the moment of explosion, a photograph is taken. The photograph shows a cone of water of a certain height and breadth. The actual height in feet is readily ascertained by the "marks" aforesaid, and so is the breadth of the cone at its base, when the calculation of the volume of water displaced is a mere matter of figures. This plan of calculation, which was adopted some years ago by the War Department in this country, is now systematically employed in America and elsewhere.

But the camera has done more than this. In a recent number of *Science for All*, a journal familiar to many of our readers, and which, under the able editorship of Dr. Robert Brown, F.L.S., has now taken firm root among the popular scientific serials of to-day, a description and sketch of a camera-torpedo arrangement appears, and this, through the courtesy of the publishers, Messrs. Cassell, Petter, and Galpin, we are enabled to set before our readers. *Science for All* says:—"The first instance on record of employing modern explosives in conjunction with electricity in a system of torpedoes was on the occasion of the defence of Venice, in 1859. At that time the Austrians had possession of the city, and, fearing the Italians might seek to approach it from the sea, the engineer officers entrusted with the defence of the place resolved to plant the harbour and channel with electrical torpedoes. The method adopted was so simple and ingenious that we must not omit to describe it. At a prominent spot overlooking the harbour was built a large camera-obscura, similar to those which may be seen at many seaside resorts. This camera obscura reflected the 'fair waters' of Venice upon a large white table (c), and



Optical Electric Torpedo employed at Venice, 1859.
a, mirror; b, lens; c, table upon which camera picture falls; d, e, wires connected with torpedoes.

every movement upon their placid surface was visible in the picture to those watching within. A mirror (a), inclined at an angle, reflected the harbour, and the picture was thrown by lens (b) upon the camera table. Some heavy charges of gun-cotton, which were to constitute the torpedoes, were now sunk in different parts of the harbour, each case of gun-cotton having attached to it electric wires, which led to the shore. The torpedoes were numbered consecutively, and the wires (d, e) attached to them brought up into the camera-obscura. As one charge after another was sunk, a sentinel in the camera watched the operation, and made a pencil mark on the camera table at the spot where the torpedo disappeared. A row-boat in the harbour described a circle round the sunken torpedo to indicate the zone of its destructiveness; and the sentinel watching this boat made a corresponding little circle with his pencil in the picture on the camera table. In the end, therefore, was to be seen, in the camera-obscura, a picture or map of the harbour, together with a group of little circles, each numbered, to indicate where torpedoes were sunk. Moreover, at hand was a bundle of electric wires leading to the several torpedoes, which were thus placed under the control of the sentinel. His duty was to watch the approach of a hostile vessel, and, so soon as he saw it get within one of the circles marked in the picture, he would proceed at once to explode the particular torpedo by means of its particular electric wire.

The Photographic News.

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CONTENTS.

THE LIQUEFACTION OF GELATINE.

We would call the serious attention of our readers to a valuable contribution by Dr. J. M. Eder upon the defects met with in practising the gelatino-bromide process. That the process has its defects is but a matter of course, and all who have any practical experience in the preparing of gelatine emulsion, and the coating and drying of plates, are well aware that these defects, insignificant as some of them apparently are, often involve the loss of much time and material. Dr. Eder tells us that not only has he collated the experiments made by Captain Toth and himself, but has included in his summary of defects and remedies those brought forward by other investigators, so that his memoir may be as exhaustive as possible.

One of the most important defects to which Dr. Eder refers, and one that has troubled many of our correspondents of late, is the disposition of the gelatine emulsion to refuse to set after it has been in use some time. This defect may be due to one of two causes. The gelatine of which the emulsion is composed has been boiled too much and too frequently, or it may not have been of good quality to begin with. The purest gelatine, according to chemists, is *ichthyocoll*, or isinglass, which, as our readers know, is derived from an internal membrane of the sturgeon, and the employment of isinglass would, no doubt, be of value to add to gelatine which refuses to set. But it is very seldom that the photographer is troubled with inferior gelatine. He usually buys the best quality, and although gelatine is derived from every conceivable source, and, therefore, possesses many and various properties according to its origin, the photographer need not trouble himself very much about gross impurities, at any rate. Bad gelatine contains impurities soluble both in cold water and alcohol, but gelatine of good quality is not difficult to recognize; in thin sheets it should be transparent and yellowish, and hard and brittle. Moreover, good gelatine, even after immersion in cold water for many hours, will not disintegrate, but remains in one mass, and should absorb about forty per cent. of water.

But even the best gelatine employed in emulsion will refuse to set on cooling under certain conditions. In boiling, whether as an emulsion, or pure, it gradually loses the property of setting altogether, and if ebullition is carried far enough the result is a liquid which on drying leaves a residue of a deliquescent nature. No wonder, then, that photographers cannot always get their emulsion to set. Dr. Eder does not even advocate boiling at all, while other successful experimenters rarely exceed half-an-hour's boiling in preparing the emulsion.

Both Dr. Eder and Dr. Lohse have shown that ammonia is formed on the heating of gelatine to a high temperature, and if ammonia is contained in a boiling solution of gelatine, the latter gradually loses the property of setting. No doubt, a little ammonia, as Dr. Vogel stated in these columns last week, may be beneficial in an emulsion, for it aids in the reduction of the bromide of silver, but it must be only a little; a gelatine emulsion digested with five per cent. of ammonia, and continuously heated, loses its property of setting.

Dr. Eder recommends that gelatino-bromide emulsion should always be kept cold. Frequent heating after the emulsion has been made has the same injurious effect as boiling does, in the first instance, if continued too long. The decomposition of the gelatine which takes place on boiling is beneficial only up to a certain stage; this once passed, and the emulsion is generally worthless. It may be remedied by the addition of freshly prepared emulsion, but not always. Finally, to recover the silver from a waste emulsion, Dr. Eder recommends heating the solution with caustic potash and a little grape sugar, when metallic silver is precipitated.

SPENCE'S METAL FOR PHOTOGRAPHY.

We recur once more to the subject of Spence's metal, with which M. Leon Warnerke has just made a series of interesting experiments. Our readers will doubtless agree with him that the material seems likely to be applicable to photographic work, and in one branch—the Woodburytype process—Spence's metal gives promise of a great deal. It is called a metal in the same sense that glass is so termed, but otherwise there is nothing metallic about it. In fact, in its behaviour and character, it appears more like sulphur than anything else. Castings made with it are extremely hard, and M. Warnerke tells us that while his graver made no impression on the metal, the metal made considerable impression on the graver.

The cost of Spence's metal, as we have previously remarked, is simply nominal. The makers hold it so cheap that they do not care to sell it in less quantities than a ton, but it may be purchased at the rate of fifteen shillings per cwt. No doubt some of our photographic dealers, should there be any demand made upon them, would be willing to retail it in smaller quantities, since there are few who would care to purchase a hundredweight of the material. A few pounds are all that are necessary for experiment, and we shall be surprised if those who follow in M. Warnerke's footsteps do not point out other likely purposes for which the material is suitable.

The metal melts at a temperature a little above that of boiling water. At 119° C. (246° Fahr.), according to M. Warnerke, it becomes fluid, and there is little doubt that once in a molten state it could be maintained in this condition by keeping the vessel in boiling water or steam. Care must be taken, however, not to raise the temperature, for it appears that at 180° C. the liquid loses its fluidity, and becomes viscous. At a higher temperature still it acquires a pasty condition, but at 300° C. (572° Fahr.) it becomes again fluid.

Spence's metal in a molten state runs very much like sulphur, creeping along a surface in intimate contact. Hence the casting is very delicate, and reproduces the finest detail. M. Warnerke showed us a casting of a photo-engraving which exhibited the most delicate gradations, and hence it is that gentleman considers the metal particularly suitable for getting impressions from a Woodbury gelatine image. As our readers are aware, the Woodburytype patent lapsed some months ago, and if it were possible by the aid of Spence's metal to secure an engraving block from the gelatine matrix, a difficulty would be solved which for years past has stood in the way of vulgarizing the Woodbury process. The expensive hydraulic presses, which are now used to get an impression of the necessary delicacy on lead from the gelatine film, would not then be required.

Notes.

A series of ten lectures on "Practical Photography" is to be delivered at the Birkbeck Institute by Mr. W. J. Wilson, F.C.S., commencing May 13th.

Encouragement to advance scientific research seems to be the order of the day in France. The Minister of Public Instruction promises a money prize of 2,000 francs for an improvement in photographic lenses, and a Monsieur Brunet has presented the sum of 20,000 francs, the interest of which is also to go towards the payment of investigators who forward science by their work. It is now some fifteen years since the Duc de Luynes, prize was awarded for photo-mechanical printing—some 10,000 francs, if we remember aright—the fortunate recipient being M. Poitevin.

When is the Paget prize of fifty pounds to be awarded? It is very certain that we are now in possession of a simple dry-plate method, with advantages equal to those of the wet process; but for all that, the task of the judges is neither an easy nor an enviable one.

A correspondent furnishes us with the following simple plan of obtaining an efficient dark room lamp. Purchase a Clarke's Patent Pyramid Night-light stand and glass, which can be obtained in any town or village in the kingdom for a shilling or eighteen-pence, and coat the little dome-shaped glass with the "ruby liquid," which is purchasable at most photographic dealers. The "ruby liquid" dries in ten minutes, and the dark-room lamp is at hand.

There are at this moment precisely half a hundred photographic societies in existence in America and on the Continent. North America comes first with sixteen, then follows Great Britain with fourteen, Germany comes next with twelve, France has five, and Austro-Hungary, the Netherlands, and Belgium count one a-piece.

Statistics, it is said, may be made to prove anything, and certainly it would never do to take the number of societies in a country as a criterion of the share it takes in the progress of an art or a science. We have no desire to cavil at America for being first on the list, but the one society of Austro-Hungary, that of Vienna, and the one Society of Belgium, with its branches at Brussels, Ghent, and Liège, must be credited with having upheld photography quite as well as other countries represented by a plurality of societies.

Since we are likely to employ gas a good deal in future for photographing, it is well to bear in mind that London gas is required to possess an illuminating power equal to sixteen sperm candles. Moreover, the Act of Parliament states that the gas shall not contain more than from ten to twenty grains of sulphur per one hundred cubic feet, nor more than from five to ten grains of ammonia.

Mr. Werge points out that gelatine plates afford a rapid means of taking "ready-made portraits," as itinerant photographers generally call the work they finish out of hand. You have simply to provide yourself with some of the white enamelled card used for backing up collodion transparencies, and with a supply of gelatine plates you may turn out portraits very quickly. You put your negative in front of a gelatine plate, and expose to a gas flame for half a minute; develop for a good transparency, wash and fix, and finally, without waiting for the film to dry, clap on a piece of enamelled card. The result is a capital picture if you have employed the oxalate developer, and thus avoided any tendency to brownness.

While on the subject of gelatine development, we should like to say a word of praise in favour of the Werge developing tray. It is simply an ebonite dish, with a loose fitting cover, faced with ruby glass, the cover having an aperture through which the developer is poured. The plate is put into the dish, the cover adjusted, and the developer introduced; you may then open the dark-room door as soon as you like, and finish developing your plate under less lugubrious circumstances.

By the way, there is no need to fix gelatine plates at once, if they are thoroughly developed and well washed. We saw half-a-dozen films the other day, which had been exposed to daylight for a dozen hours and more, unfixed, and were bright and clear to a degree.

So long ago as the days of Nicéphore Niepce it was known that bitumen of Judea could be employed in photography, but the constituent which rendered that substance sensitive to light has only lately been discovered. Liebermann, the inventor of artificial alizarine, supposed the property to be due to the presence of anthracene, which, by the action of light, he found to be converted into paranthracene; but, unfortunately for this hypothesis, asphalt contains no anthracene.

Dr. Kayser, of Nüremberg, finds that fifty per cent. of a mass of bitumen of Judea is soluble in alcohol and ether, the remaining fifty per cent. being insoluble in these substances, but soluble in chloroform and turpentine. From the latter solution a precipitate was thrown down on exposure to light, whereas the alcoholic solution remained unaffected. Hence, to render the bitumen more sensitive, Dr. Kayser concludes that it should be first treated with alcohol and ether, which will dissolve out the constituents not susceptible to the luminous influence.

In commenting on these researches of Dr. Kayser, Professor Vogel remarks that thymochinon, a substance which is now produced commercially in large quantities, is much more sensitive than bitumen, being converted by the action of light into parathymochinon, which is not so soluble as thymochinon in alcohol and ether. Professor Vogel goes on to observe that there are several other bodies known in organic chemistry possessing analogous properties; but, unfortunately, the chemists who occupy themselves with this branch of science are inclined to neglect the observation of the action of light on organic substances.

Topics of the Day.

NOTES ON SPENCE'S METAL.

BY L. WARNERKE.

Being requested by the Editor of the Photographic News to contribute a "Topic" to his paper, I decided to give an account of my last experiments with Spence's Metal.

A short time ago a new substance, inappropriately called metal, was introduced to the notice of the scientific public of London at an ordinary meeting of the Society of Arts by the inventor, Mr. Spence.

An extract of this paper was communicated to the readers of the Photographic News,* and this will absolve me from the necessity of a repetition of what was said in that paper.

Broadly speaking, the new substance is a compound formed by the addition of sulphide of any metal to molten sulphur. This compound is proclaimed to be easily fusible, quickly setting on cooling, taking very delicate impressions, and not affected by chemicals, being at the same time ridiculously cheap.

These general characteristics created in my mind an impression that this so-called "metal" may be useful in photography: with this view I decided to try it. The result proved the correctness of my supposition, and in the present article I intend to communicate my observations.

My first step was to get the "metal." Thanks to the politeness of the Editor, I learned that at Messrs. John Berger Spence and Co.'s, 31, Lombard Street, I could get what I wanted. I repaired to that place, and there I again contracted a debt of gratitude for the extreme kindness of the gentleman at the head of the business, I presume Mr. Spence himself, who showed me numerous specimens of articles for which the "metal" can be applied, such as copying sculptures, medallions, busts, monuments, &c. Among this numerous collection I observed a mould or counter-impression from a steel-plate engraving, very delicate, and a cast made by pouring the "metal" in a glass beaker, having a glossy surface of glass, also exposed for a very long time to the action of the atmosphere outside the window.

I have been informed that this "metal" is used already by a great many gas companies for the junction of pipes, and that the Company is resolved to supply the "metal" wholesale by tons; they would not object, owing to the novelty, to sell, if ordered, a single hundredweight, price 15s. I have been on this occasion presented with a lump of ten to fifteen pounds to begin my experiments.

This lump evidently was part of a much larger prism, bearing a few letters evidently forming the name "Spence's Metal." It is not so heavy as iron, grey in appearance, the broken sides very much resembling fine cast iron or steel. The sulphide used for the composition of "metal" is generally some iron ore.

A few sharp strokes of the hammer soon reduced it to a more manageable size, proving also its great brittleness. Some was placed in an iron (enamelled) saucepan and put on the fire; but this was a mistake, because, before the metal melted, the sulphur ignited. I amended this failure by applying only the very gentle heat of Fletcher's slow gas stove; the result, after a very short time, was a fluid quite fit for any application of moulding.

I must at this point remark that the effect of heat upon the metal is almost identical with sulphur—viz, it began to melt at 119° Cent. (246° Fahr.) and gave very fluid liquid; when the temperature is raised to 180° Cent. (356° Fahr.) the liquid loses its fluidity and becomes viscous. With higher temperature it acquires a pasty condition, but at 300° Cent. (572° Fahr.) it becomes again liquid.

The best plan I found is to remove the saucepan from the stove as soon as it is observed that at the bottom, naturally more heated, is formed a pasty nucleus. In this condition the liquid mass is full of air-bubbles, and consequently unfit for casting; but by waiting a few minutes and occasionally shaking the liquid it becomes smooth and ready for use.

A cast of any material can easily be produced by pouring the molten "metal" on it. However, certain precautions can be suggested for facilitating the work; 1st, the object from which the cast is to be made should be warmed as much as possible—this is especially necessary with a glass plate, which will crack if this precautionary measure is omitted; 2nd, the molten "metal" must be as cold as is consistent with fluidity, for when too cold, the surface, although perfectly smooth, shows crystalline formation; 3rd, pouring the "metal" must be done without hesitation or stoppage, otherwise concentric marks in the lines of stoppage will be perceptible.

I found that as soon as the cast is cooled it could be detached without any difficulty from almost any surface, except from too spongy or too porous substances—such as soft wood.

Very remarkable superiority is observed in the casts made from this metal over all other systems of moulding. This superiority is confined to the delineations and to the flatness or rigidity; thus, if "metal" is poured on the glass plate, a perfect mirror is produced, and so flat that the phenomenon of attraction so well known between two patent plates can be observed in this case.

Casts from metallic engraved plates, from relief impression on paper, from leather, ivory, carved wood (hard), and glass, were successfully produced. When a test tube was filled with "metal" and soon after emptied, this resulted in a tube similar to the original glass, but in "metal."

Metallic articles warmed first, and dipped quickly in the molten "metal," are covered with it, offering sure protection against the corroding action of acid. The tubes can thus be lined with a preserving coat.

All this is of only secondary utility for photographic experimentalists; but its greatest value will be without doubt the application of it to the Woodburytype process. Expensive moulds produced by pressure, or even newer systems, can be superseded by casting the "metal" mould from the gelatine relief. A few experiments made in this direction convinced me that this system will supersede the others. The impression obtained is perfection—flatness absolute. Besides this, "metal" mould is decidedly harder, and consequently less subject to the mechanical injury and usual wear and tear, than the one used at present. Gelatine ink leaves the mould very well indeed.

Let us consider the question of the back of the mould; this must be very smooth, on account of the brittleness. However, it is not so when metal is cast simply on the form to be moulded. Naturally, the idea suggested itself to me to improve it by turning it in the lathe, or by planing it; consequently, after fixing the cast in the suitable *chuck*, I put my best cutting tool in the slide rest, and put the lathe in motion; but, to my astonishment, I soon discovered that it was not the metal that was cut, but my best cast steel tool, which was being ground at the rate of a quarter of an inch in a few minutes The moral is that the "metal" cannot be turned. A planing machine can be used, provided the cutting tool is not allowed to take too much at a time, because it chips the "metal" irregularly.

The best plan, however, is one suggested by Mr. Spence, viz., to have a cover the shape of the lid of a box, in iron, with a hole through which the molten "metal" is poured when the cover is placed in position.

On testing its mechanical property, I found that engravers' tools can be used satisfactorily, but not too deep at one operation. It can be drilled, but with the sacrifice of the drill; it can be sawn and filed. It is very hard, and with a rounded metallic rod it is almost impossible to

* See Photographic News for March 19th.

injure the cast impression. My lathe failure suggested the application of grinding, and I have been surprised to find that a cylinder in "metal," revolving in the lathe, can cut not only steel, but glass also, and this with rapidity; besides, the surface cut is perfectly polished.

In continuing my experiments, I found that gelatine relief, provided it was rendered insoluble by chrome alum, can be cast while wet.

The block for letterpress printing in this "metal" is very fine, and takes ink very well; better than one in ordinary metal.

Now I must relate another failure. I wished to test how it would answer for electrotyping. It is a well-known fact that sulphur cannot be electrotyped successfully, because of the difficulty of metalising with plumbago, and of the action of the solution of copper. In the case of "metal" it is not quite so; it takes plumbago very well, even when the cast is taken from glass, but evidently the action of the copper solution remains the same as in the case of sulphur. A "metal" cast, suitably connected with an electric battery, was immersed in the solution of copper sulphate (neutral); no deposit could be obtained, and when the mould was removed, after twelve hours' immersion, I observed that the flat mould was terribly bent, and was partly blue instead of grey, very brittle, and without cohesion. When dry, I observed that the fine impression of the engraving was spoiled by the formation of crystals. Another moral to be derived; "metal" is unsuitable for electrotyping.

My paper will not be complete without a description of this last experiment:—A "metal" plate was prepared, by casting on a glass plate; on this a drawing was produced by pen and ordinary ink; when dry, it was washed several times with bisulphide of carbon. A large quantity of sulphur was very rapidly dissolved, and the parts protected remained boldly standing in relief; in the hollows, black iron salt (sulphide) was in a powdery condition; it was removed afterwards with brush and water. The etching process lasted no more than thirty seconds. Next, a carbon print was developed on the metal plate, and successfully etched with bisulphide of carbon.*

The "Topic" for next week will be "The Modern Preparation of Gelatine Plates," by William Bedford.

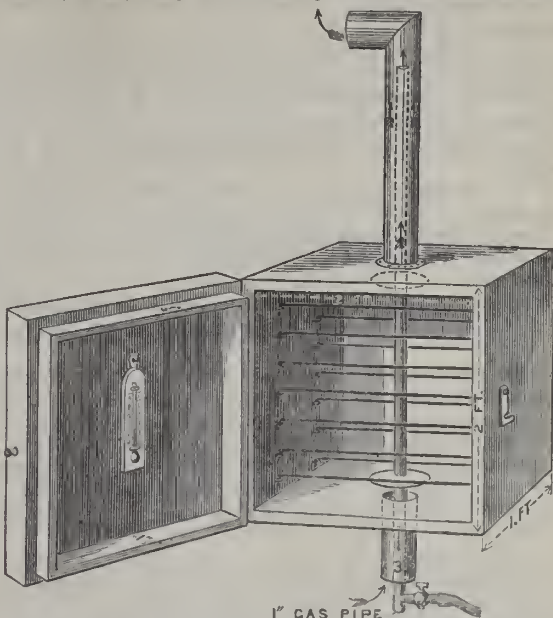
THE ENGLAND DRYING BOX.

In our "At Home" of the 9th inst., we had the pleasure of giving our readers a rough outline sketch of a clever contrivance of Mr. England for drying gelatine plates. We stated at the time that a more elaborate drawing was being prepared, and this we are now enabled to place before our readers. Particular attention should be paid to the upper portion of this drawing, as our former diagram was imperfect in this respect; but with the information now at their disposal, none of our readers should find any difficulty in constructing a similar cupboard.

In bringing this drying box to the attention of the Photographic Society at their last meeting, Mr. England said:—

It will be seen that in reality the box is nothing more or less than a light-tight cupboard, with wires stretched across to support the plates. Through the centre runs an inch-gaspipe, open at both ends, at the bottom of which is a small gas jet which burns inside. At the top and bottom of the box are two draught holes, cut to which tin tubing of about three inches diameter is attached, as shown in the figure.

The gas tube gets warmed with a very small jet of gas burning in it, a mere pin-hole being sufficient exit for the gas. This warms the air in contact with the tin tube, and also slightly the air inside the cupboard. The consequence is, that a current of slightly warm air is set up and circulates amongst the plates while supported on the wires, and the drying of the films take place rapidly. Five or six hours is a sufficient time in which to dry the plates, whilst without the gas jet it would take twenty-four hours or more. In the inside of the cupboard, and near the top and bottom, are placed two cardboard discs to stop the possibility of any stray light entering, and as the whole affair is



1" GAS PIPE

placed in the dark room the chances of any such access even without it would be small. I do not know if this answers better than the cupboards made usually, where the same air has to pass over the whole of the plate; but, at any rate, this is very simple, and answers its purpose for my work. It seems to me that the process of drying the plates is more dependent on a thorough circulation of the air than on a passage of the air over every plate. On the inside of the cupboard door I place a thermometer, and regulate the jet so that a temperature of about 70° is indicated—80° would do no harm to the plates; beyond that temperature it might not be safe to go. I coat half-a-dozen plates at a time, and place them on a level glass shelf, and by the time the last is coated the first is sufficiently set in this weather to place on the rack, so that there is no loss of time in the preparation of the plates. The small gas jet I use is the same as may be seen in tobacconists' shops. The hole in the end is plugged up, and a very small hole drilled at the side.

It might be thought that this arrangement would cause some unequal drying, but it is not the case; the plates dry evenly, and no failures have been met with from this cause.

DEFECTS IN THE GELATINO-BROMIDE PROCESS.

By Dr. J. M. Eder.*

2. *Faults in the Preparation of the Plates.*—*a.* Streaks, wave-lines and unevenness, are caused by the glass plates being too cold, and the emulsion not warm enough, so that the latter sets while it is being flowed over the plate. By previously cleaning the plate with soluble glass the flowing is much facilitated. Many people warm the plates first, but if they are made too hot, streakiness will again ensue. The best means of avoiding the difficulty is to stand the flask of emulsion in hot water of from 40° C. to 60° C.

(*b*) In summer when the temperature is high, the emulsion will not set on the plate at all. This must be prevented by resting the plate on a cold slab of metal or stone, having a temperature not exceeding 10° C., and placed carefully in a horizontal position; under these circumstances the emulsion will set in five minutes.

* Specimens of the result of these experiments are deposited in the library of the Photographic Club, Ashley Hotel, Henrietta Street, Covent Garden, for the inspection of persons interested.

* Continued from page 190.

c. Air bubbles may be avoided by taking care not to shake up the emulsion violently before flowing it over the plate, and by pouring back the excess of emulsion (that is if it be necessary to pour off any excess) into a separate flask. If the emulsion be quite full of bubbles they may be kept back by tying some loose stuff, like muslin, over the neck of the flask.

d. Circular bands and rings are formed when the plates are dried by hot air in a drying box, and when during the process the door of the box is often opened; by this means the drying, or rather the cooling, is interrupted. This defect is seldom observed when the plates are dried in the open air.

e. The emulsion must not be flowed over the plate too thin, otherwise vigorous negatives will never be obtained; haloes also, in this case, are liable to form.

f. For defects caused by too protracted desiccation, see above, § 1, *e.*

g. Should the plates be dried at too high a temperature, or the drying box be overheated, they will fog in developing.

h. Gelatine plates, which after the emulsion had been flowed over them, and had set, were plunged for from half an hour to an hour in a bath of alcohol, but found to crack on the surface of the film in consequence of the gelatine contracting too quickly. Dr. Székely also showed me some plates that had been treated in this way, which exhibited, after developing and fixing, dark round spots in the negative.

3. *Fogging owing to the Penetration of Actinic Light.*—This defect occurs only in the case of inexperienced beginners, or careless operators. Great care must be taken to use only perfectly light-proof cameras and boxes, and attention should be paid to the choice of thoroughly non-actinic glass for the panes of the dark-room. The objective, too, must be carefully screwed into the front of the camera.*

4. *Defects due to Incorrectness of Exposure.*—These defects are the most frequently met with. Under-exposed plates, when developed in the ordinary way, give black and hard negatives, which with the ferrous oxalate developer have a glassy appearance; and if they are more forcibly developed with the alkaline pyrogallic developer, this may render the details more strongly, but they are weak and print badly. The opposite extreme of over-exposure is still more common. In this case the image appears very quickly; in a short time the higher lights come out, and soon afterwards the half-tones and deep shadows. To prevent the complete fogging of the plate the development must be stopped, before the reduction has penetrated through the film, and the negative becomes visible on the reversed side.

5. *Defects in Developing.*—This kind of imperfection appears more especially when the alkaline pyrogallic developer is used, not so often with the ferrous oxalate developer.

a. The gelatine plate is sometimes covered with dust, and the particles very often give rise after development to spots. It is therefore advisable to dust the plates with a soft brush before placing them in the camera, for dust is also a hindrance during exposure.

b. When the negative from any cause—such as under exposure or defective emulsion—does not develop vigorously, it is the custom to force the development by increasing the proportion of ammonia, or sometimes that of pyrogallic acid. This has the effect of promoting the appearance of the details, but it often also causes fogging, and the negative besides remains thin and weak. In this case we may improve matters by increasing the quantity of potassium bromide in the same ratio as that of ammonia, and thus ultimately the defects due to errors of exposure, or to faults in the emulsion, may be corrected. The defect due to forcing the development is more especially noticeable when the alkaline pyrogallic developer is used, though under normal conditions the latter is excellent; it is less liable to occur with the ferrous oxalate developer. Ferrous oxalate, moreover, gives the inexperienced operator a better chance of obtaining good results, for in using it there is not so much to be lost by inferior manipulation as is the case with the alkaline pyrogallic developer.

c. If too much ammonia has been added to the pyrogallic developer, or if the development has been carried too far, the plate will be covered with an evenly distributed, yellow, or sometimes yellowish red, fog. By decreasing the proportion of alkali, and increasing that of potassium bromide in the developer, this defect may be avoided. This yellow fog may often be got rid of by dilute (1 : 80) hydrochloric acid, or by a weak solution of potassium cyanide. With ferrous oxalate the fog is not observed.

d. When the development is a normal one, weak, dull, and fogged negatives can only be caused by over-exposure, or they are due to a faulty emulsion. If the development be forced, the defect is rendered more visible. To prevent it, increase the proportion of potassium bromide; or, when the negative has been over-exposed, dilute also the ferrous oxalate solution with water, or decrease the quantity of ammonia; or, again, use the carbonate of the alkali instead of the alkali itself. If the ferrous oxalate developer has an alkaline instead of an acid reaction, the same defect will be observed, and can be removed by adding a little oxalic or acetic acid.

e. When pyrogallic acid is used that has turned brown with age, the negative will often show a yellow fog.

f. A white milky veil is sometimes seen when the ferrous oxalate developer is employed. This is the same appearance, to which I have given the name of "chalk-veil," that occurs when the plates are washed in spring water; it is due to a precipitate of oxalate of lime formed by the oxalic acid of the developer coming into contact with the lime of the hard water.* This, however, is of no consequence, for it is quite transparent to light, and, moreover, disappears in varnishing. With the pyrogallic developer this chalky precipitate does not occur even when spring water is used, for caustic ammonia only precipitates lime after the lapse of some time. Still it is better always to use distilled water for the purpose of washing—or, at least, rain water.

(*To be continued.*)

Correspondence.

GELATINO-BROMIDE PREPARED WITH EXCESS OF SILVER.

Sir,—The opinion seems to be so general that it is difficult, if not impossible, to prepare gelatine emulsion commencing with an excess of silver, instead of an excess of bromide, that I venture to place before your readers my experience, hoping that by doing so I may induce some to try what I believe to be theoretically and practically the right method of preparing sensitive gelatine plates.

In making the emulsion I adhere closely to the instructions given by Captain Abney, R.E., F.R.S., in a paper published in the News, January 30th, 1880. The only alteration I make in the quantities there given is to reduce the amount of gelatine from two hundred grains for seven ounces of emulsion, to one hundred and fifty. I do this because I find that I thereby obtain a film with a fine matt surface, instead of the bright surface which, in my hands, is produced by the two hundred grains of gelatine.

* See Introduction to "Photography by Gelatino-bromide," by Van Monckhoven, Vienna, 1880; also, *Photographische Correspondenz*, xvi., No. 190, p. 197.

* "The New Ferrous Oxalate Developer Compared with that of Pyrogallic Acid," by J. M. Eder, Vienna, 1880, p. 10; also, *Photographische Correspondenz*, xvi., No. 191, p. 231.

It is important that the solution of bromide should be added to the solution of silver, never the silver to the bromide, and that the addition should be made very gradually, and with constant agitation. To add twenty ounces of bromide solution to six ounces of silver solution occupies me rather over twenty minutes. I run the solution from a filtering funnel, to the stem of which I have attached, by means of india-rubber tubing, a piece of glass tubing drawn out to a fine jet. The funnel being suspended from a retort stand, leaves both hands free for the stirring. When the silver bromide is washed free from acid, I dissolve the one hundred and fifty grains of gelatine in five ounces of water, add thereto the silver bromide (by preference in a stoneware jar, or bottle), place in a workman's breakfast can containing water at about 100° Fahr., and heat by means of a Bunsen burner until the water boils freely. The emulsion is then filtered through cotton-wool, and is ready for use.

There is only one thing to guard against, and that is, too prolonged boiling, as for the following reason it tends to produce fog. Stas has shown that boiling causes precipitated silver bromide to become so finely divided that it will with difficulty settle out of water, and will freely pass through the pores of the best filter paper. This finely divided bromide is partially soluble in ammonia. It dissolves, therefore, during development, and is acted upon by the pyrogallic acid, which produces a precipitate of silver, or, in other words, fog.

Now, ammonium bromide prevents almost entirely the solution by ammonia of silver bromide, and therefore, if the developer contains a sufficient quantity, fog, during alkaline development, is prevented; but if a large quantity of bromide has been required, fog is prevented at the expense of speed. In my opinion the most sensitive emulsion is that which has received the maximum of boiling, and requires the minimum of bromide during development.

In conclusion, I may add that I dry my plates by a draught of cold air, drawn from outside the house, on the principle of the Tobin ventilator, by the difference in temperature between the inside and the outside. Since I gave up drying by heat I have never had a frilled or blistered plate; before that my plates were always liable to frill. I believe that drying at a high temperature causes the surface of the gelatine to become impervious to moisture, consequently driving the steam, which is generated beneath that impervious film to escape at the edges of the plate, destroying the adhesion upon which success so materially depends.

It is a well-known fact that in order to preserve the juices in meat, a good cook roasts the joint rapidly at first, thereby producing an impervious film; but on the other hand, to make good soup—that is, to extract as much as possible of the juice, the cook places the meat in cold water, and gradually raises the temperature.—Yours, &c., HOLBROOK GASKELL, Jun.

Clayton Lodge, Aigburth, Liverpool, April 19th, 1880.

PAYMENT OF ASSISTANTS.

SIR,—That was rather a puzzler of a question you had put to you under the above title last week: I think you tacitly acknowledge that, as you do not answer it, but give instead a piece of advice—very good advice it is, too—to the class of men that "An Operator of Six Years' Standing" belongs to. There is one thing that I must compliment the writer of the letter alluded to upon, viz., its simple style and candid tone. "I want to know what are fair wages for an operator," he asks, and qualifies his question by adding: "I can coat a plate and develop it, and do everything handy: I have not retouched much, but I can soon learn it." I hope his success will keep pace with his confidence in the latter assertion! "Can also print and tone well." That is all that he says he can do. "'Tis brief, my lord," but full of matter. I am not one to depreciate the value of the assistant—not likely!—for I am one myself, and hold firmly to the text of the labourer being worthy of his hire. I write with a good deal more than double the years' experience of the last week's writer, and I hope he, and assistants like him, will take in good part what I am about to say.

In the first place, he says he has thirty shillings per week for the exercise of the above-mentioned qualifications, said qualifications being, that he can coat a plate, develop it, print, and tone. If, as he acknowledges, that is all the results he can produce after his "six years' standing," I am afraid he must have been rather dense, and must say that I think he has a fair, a *very* fair, remuneration for the exercise of his talents.

A little calm reflection will show any reasonably disposed party that a clean-fingered lad with an ordinary intellect will learn all the above qualities, and become quite proficient in them, in little over six months. If dark-room assistants, like the six years' standing man, were to receive, as he evidently expects, forty to fifty shillings per week, what sort of a sum would the head-worker require—the one with the artist's eye, the fertile brain, and the worldly tact? It makes me giddy to think of it, and begin to wish for such a state of things!

My advice to such assistants resembles the letter of he of "six years' standing." It is simple and to the point. Their employers are the best judges of the value of their services; therefore, if an assistant thinks he is underpaid, let him at once apply for a rise of wages; if he is really a good hand, and knows his work, it is his master's interest to keep him on, and he gets what he deserves; if the reverse, he is then at liberty to go forth and find his value in another market. This is the only practical answer that can be made to the question asked in last week's impression.

Apropos of the subject, did you ever remark the absurd way that assistants word their advertisements when in quest of a situation? By the numerous virtues and talents of some, one would think that human perfection had at length been attained. They can pose, paint, either in water-colours or oils, retouch, are successful with children—finish opals and carbons, and make themselves generally useful! And the best of it is, you can have this born genius dirt cheap.

I recently observed the following advertisement:—"*First-class Operator and Retoucher* desires a situation as *General Assistant* in a good house."

Can there be anything more absurd than that? A first-class (?) man applying for general utility! Is it any wonder that the bulk of assistants are looked down upon with strong distrust? It would be well for the whole profession if they all were as straightforward in enumerating their talents as the operator of six years' standing.

Will you allow me to finish this letter by having a cut at the third-rate employer? He makes as foolish blunders and shows the cloven foot as much as ever any green gooseberry of an operator. There is one I wot of that has lately taken to the dry plates. He, as a matter of course, talks largely of *his process*, advertises strongly, and caps the matter by showing some pictures "taken by the *Instantaneous process*," and adds underneath, "*Exposure—two seconds.*" He is not an Irishman, either.—Yours truly,

"BEAU NASH."

UNFAIR COMPETITION.

SIR,—A lady called upon me recently and asked the price of a finished portrait in black and white, of a group of three children. I quoted a price, and was politely told that if I would lend her the negative, a well-known firm had offered to do it in that style for a guinea. I will not comment on the above.—Yours truly, A PHOTOGRAPHER.

[We scarcely understand "A Photographer's" grievance. Obviously he is master of the situation. "If" he will part with his negative, and forego all charges for his time and

skill, then the lady will be able to get her picture at a cheaper rate. If the firm in question would further oblige, by not charging for their assistant's time and work, the lady would be better off still. But, unfortunately, that is just what photographers, and our correspondent among the number, will not do; they do not "lend" their negatives or their brains, and hence the comfortable arrangement in question does not come to pass. We think "A Photographer" may well afford to rest and be thankful.—Ed. *P. N.*]

OXALATE DEVELOPER.

Dear Sir,—I have tried nearly all the various formulæ, both alkaline and iron, in developing gelatine dry plates; and, in my opinion, Dr. Eder's is by far the simplest and most efficacious. Having neither French weights nor measures, I made the two following solutions :—

A.

Oxalate of potash ...	4 ounces, 80 grain, cost	1s. 0d.
Distilled water ...	17½ ounces, cost (say)	0s. 1d.

B.

Sulphate of iron ...	1 ounce, 5 dr. cost (say)	0s. 0½d.
Distilled water ...	5½ ounces cost (say)	0s. 0½d.
Sulphuric acid ...	3 drops	
Total cost, 23 ounce solution	(say)	1s. 2d.

I poured one ounce of B, into a developing glass, and then added three ounces of A; with the four ounces of solution thus obtained I developed twelve half-plates. The developer worked rapidly, and for the cost of about twopence I obtained twelve negatives rivalling any that could be obtained by the wet process. I forward a sample.—I am, faithfully yours, Chas. D. Davies.

15, *Lee Park, Lee, S.E.*

Proceedings of Societies.

Edinburgh Photographic Society.

The ordinary monthly meeting of this Society was held at 5, St. Andrew Square, on the evening of the 7th inst., Mr. John Lessels, President, in the chair.

The following three gentlemen were unanimously admitted ordinary members :—Mr. Chas. A. Stitt, Mr. Arthur P. Lawrie, and Mr. Andrew Burnet.

Mr. Frank P. Moffat read "A few Remarks on the Working of Gelatine Plates in the Studio," which was followed by an interesting discussion, in which Messrs. Lessels, Mathison, Alex. Nicol, Burton, Anderson, Airde, and Balmaine took part, after which a contribution from Mr. Andrew Pringle (now of Sorrento) was read by Mr. Forgan.

The President next translated a communication regarding the forthcoming photographic exhibition in Ghent, and intimated that as he purposed being in Ghent on the 20th of May, he would be happy to relieve of all trouble and expense any members who intended to exhibit, by taking charge of their pictures, and personally delivering them into proper hands.

Mr. Mathison exhibited two varieties of instantaneous shutters, after which the usual votes of thanks terminated a most interesting evening.

Glasgow Photographic Association.

A meeting of this Society was held in the Religious Institution Rooms, Buchanan Street, on Monday evening, April 5th, Mr. John Urie in the chair.

The minutes of previous meeting being read and approved of, the business of the evening, viz., "The nomination of office bearers for next session," was then proceeded with.

Presidents—Messrs. J. J. Long, Parker, and Urie.

Vice-Presidents—Messrs. A. Robertson, J. Bowman, Paton, and Dodds.

Secretary—Mr. W. C. Ramsay.

Treasurer—Mr. Geo. Bell.

Auditors—Messrs. Parker and Mactear.

Council—Messrs. Reid, Morran, McLillan, Leask, Gardiner, Cutting, Skinner, G. Mason, J. Fergus, Gilfillan, S. Alexander Stirling, and Dr. Fairlie.

There being no other business, a vote of thanks to the Chairman brought the meeting to a close. Jas. McGhie, Hon. Sec.

West Riding of Yorkshire Photographic Society.

The ordinary meeting of the above Society was held at the Market Tavern, Bradford, on the 6th inst., at 7. 30 p.m., Mr. Passingham in the chair.

The forepart of the evening was devoted to a conversational discussion on dry plate work, after which Mr. Crosthwaite read a paper entitled "Stray Thoughts" (in our next).

Mr. Bridges exhibited a large lantern for dry plate work, the sides of which were covered with a canary-coloured paper which, though giving a splendid light to work by, effectually cut off all injurious rays. The lamp was tested by several of the members developing plates by its light, and the opinions as to its success were unanimous.

Mr. Bridges read a short paper on "Canary Medium *v.* Ruby Glass" (in our next), after which the meeting became again of a conversational character, and was shortly after adjourned.

To Correspondents.

Dry Plate.—See illustration this week; there should be a right-angle chimney into which the inner tube leads; you can see this in the wood cut.

W. B.—There is no doubt hyposulphite in the mount; had the spots been due to the gilt metal, a tiny black speck would have appeared in the centre; a magnifier does not show these.

G. Day.—Hydrogen is usually made by the action of sulphuric acid on zinc. We do not know what you want the gas for, but if in large quantities, it may be economically obtained by passing steam over hot iron turnings. Let us know what you want it for.

A Beginner.—1. Where liquids are concerned, fluid ounces are understood, the pint containing twenty; if you are buying a graduated measure, we advise you to get one divided into cubic centimetres, which is to be had at any dealer's. No. 2. The swing-back will not do away with distortion in architectural views, but it permits you to humour the object in a great measure; the swing-back allows you to bring into or throw out of focus top or bottom of the picture, and thus permits you to focus the most important part thereof.

Studio.—We are not sure; it may be one of Ross's portrait lenses, but Mr. Blanchard would tell you, no doubt, if you wrote him. A well-lighted drawing-room would answer very well for many purposes; but we do not think photographers can do without their studios just yet.

Captain Turton.—You will find that—

Double chloride of gold and potassium ...	1 part
Chalk	2 to 3 parts
Water	1,000 ,,

will give you a very good toning bath, and is, we believe, the one you refer to. We are glad to hear of your success with the oxalate developer. For ourselves, we always employed distilled water, but if your hard water is good, there can be little objection to it. The intensifier you refer to is certainly one of the best.

Enlarger.—1. Yes. 2. You do not say how the canvas is to be sensitized; gaslight will only do in the case of a gelatino-bromide film. For an iodide developing process you would want a stronger light. 3. A common deal box would do for making an improvised camera.

Thos. McCann.—1. Much quicker. 2. Yes. 3. See leader in Photographic News for April 9th, as also "Topic" for next week; these will give you all the information you want on this head. 4. Paint in distemper: greys of a brownish or drab tint are most suitable. 5. Your collodion should not have suffered in a year. 6. The gelatine you send would be suitable. Thank you for your kindly expressions.

P.—Any well-known apparatus maker could supply you, no doubt, for many photographers avail themselves of combination printing. Your idea of combination is a happy one, and should bring grist to the mill. Mr. B. J. Edwards patented a very clever arrangement some eight years ago.

P. Mitchell and Co.—We regret to receive your letter, but we have not yet had the specimens you write about. Why not do the transfers yourself? The operations are not difficult, and you can improvise a camera very easily by working in a dark room. The main difficulty is in toning, and if you employ iridium and gold instead of ordinary toning solution, this is overcome.

T. Barnes.—Follow Mr. England's advice. A pound of the best seed lac is put into a quart bottle of methylated spirit. The lac is shaken up from time to time, but the solution is not heated. After two or three days the spirit will have taken as much lac as is necessary, and the clear liquid is poured off. The residue may either be thrown away, or employed again with fresh lac.

Hypo.—A dilute solution of iodine and starch will do all you require. See "Topic" of the 9th April.

The Photographic News, April 30, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photography and Fashion—Photographic Societies and their Advantages—The Diaphote.

Photography and Fashion—Despite what purists may say to the contrary, pnotography owes not a little to what has been termed the "frivolity of fashion." We do not suppose that the possession of a new suit of clothes has ever induced a man to go and have his photograph taken; but we are by no means sure that a new dress does not often have some influence of this kind on the fairer half of creation. The most aggravating part of the matter, however, to photographers, is that fashion is not always artistic, and when the new dress is reproduced as a picture, it is sometimes found not quite so pleasing as it seemed to be. In these cases sitters generally contrive to find some fault with the expression, or pose, and only show the real reason of their discontent when they appear for a resitting in a different dress. This, of course, is very annoying to the photographer, and he requires some tact and strength of mind to avoid offending his customer on the one hand, and being made the victim of caprice on the other. Perhaps there has never been a greater call upon his intelligence in dealing with matters of dress than at the present time, now that costume balls are so much the rage, and when every one who puts on masquerading attire deems it necessary to perpetuate, by means of photography, his or her counterfeit presentment thus disguised. From one point of view nothing can be more laudable, and the more photography is patronized the better for the commercial success of the art. But when you have a gentleman made up as a bold buccaneer, and with a face as mild as a sucking dove; a cavalier of the time of Louis Quatorze with silk stockinged calves like spindle shanks; a Spanish Don, upon whose recreant limbs the unaccustomed garb seems to hang as on a lay figure; the unfortunate photographer is put to his wits' end to enforce dignity with his sitters, and to deal with them with some appropriateness of pose and surroundings. The fantastic dresses and violent contrasts of colours fancied by the lady-masqueraders are also severe tests, and must make a man of taste grind his teeth when he finds, with all his skill, he can only produce grotesque patches of black-and-white, which *will* persist in coming in the wrong place for artistic effect. We lately saw the photograph of a lady who had chosen to go to a fancy ball representing the game of "Nap." The dress was of white, and decorated with playing cards strung together, and bright pennies sewn on here and here. Here were materials to be dealt with of the most *outre* character, and we are bound in truth to say the photographer had *not* triumphed over the difficulties. The wide range of costumes also necessitates a greater variety of background than is required in ordinary use; but this, of course, is a matter easily arranged if a man can paint his own. We see, however, no reason why photographing human nature in fancy costumes should be discouraged, but rather the reverse. Photographs are not so much a part of domestic life as they were in the days of the carte mania, and anything which can give a spurt to the art ought to be gladly welcomed. With dry plates, and with the Luxograph light—we should like to say the electric light, but this is still in the future, so far as a convenient and portable means of producing it is concerned—it is not a difficult matter to photograph persons at their own homes. It may so happen that ere long it will be as common a thing for a lady, before she goes to a ball, a garden party, or is presented at Court, to send for the photographer, as it is now for her to send for her hairdresser. Had photography been known in the days of Sheridan, most assuredly he would have introduced in his "Trip to Scarborough," a photographer in company with the tailor, shoemaker, jeweller, hosier, sempstress, and perruquier, to whom Lord Foppington devotes the business of his life.

Photographic Societies and their Advantages.—It may appear to some that we have taken a low and degrading view of the photographic profession in the above remarks. We have no intention of so doing. In being linked with the foibles of fashion, photography suffers no degradation, and it simply depends upon the photographer himself whether he maintains his dignity or not. There are not a few men who look upon photography in a commercial aspect only, and with a view to making money. Their sole energy is devoted to finding out the best mode of taking the greatest number of sitters per day, and of turning out proofs with the least expenditure of money possible compatible with durability. The class of photographers to whom we allude are shrewd businesslike men, who know the value of good assistants, and, therefore, pay them well, and who also know that the secret of a successful photographic business is to produce what the public like, and who prefer following the public taste, to leading it. We are not going to say they are wrong, but what we do say is that many of these purely commercial photographers affect a contempt for photographic societies and their members which is not only absurd, but unjust. "Why do you not belong to a photographic society?" we said the other day to one of this class, a man of good manipulative skill and unbounded industry, so far as dealing with the public is concerned. "Well," said he, "I don't see the use. It seems to me only a waste of time for a man in business to go to these societies just to hear other people talk. Besides," and this seemed to be his strong point, "you don't find the men who have made money in the profession at these societies. You never see their names as speaking at the meetings. Depend upon it, those who talk are not always the best nor the most successful workers." We leave it to our readers to say whether this dictum really represents the truth. Even were it the case—which we most certainly deny—the question of success or non-success pecuniarily has nothing to do with the value of a discovery or an improvement in manipulation. The individual in question, for the same illogical reason which led him to despise societies, also affected a contempt for photographic literature. "My own practice" appeared to be the beginning and end of his ideas, and he regarded his "clean," sharp, highly enamelled commercial productions as the highest aim to which a photographer could attain. The public liked his work, paid their money with alacrity, and he, on his side, manipulated them like machines. He was thriving, he had a good balance at his banker's, and why should he trouble either about photographic societies or photographic journals? These were his opinions. How would it be if every photographer held similar ones? Nothing, we maintain, has done so much to maintain a high tone among photographers as the various photographic societies. Their value, so far as a stimulus to research and experiment, and an opportunity of making known the results, are concerned, goes without saying, while the mere meeting together of men working in the same direction often produces benefits which are none the less to be esteemed, because at first sight they may not be apparent. The pleasant desultory chat which follows the more formal business of the evening, every man who attends knows full well, is frequently of as much use to him as the discussions arising from the papers read; but this benefit, of course, does not reach the man who only reads the reports of the meetings. It is as much a mistake to suppose that art, science, and business capacity cannot be united in the same person, as it is to imagine that photographers who are successful commercially cannot learn much by becoming members of a photographic society.

The Diaphote.—There is literally nothing new under the sun. Some few weeks back we noticed in these pages the

discovery of the diaphote by a Dr. Licks, of Pennsylvania, by means of which light can be transmitted by electricity from one place to another. Dr. Licks's method was to use a mirror composed of an amalgam of selenium and iodide of silver, and the chemical changes set up in the amalgam consequent upon the impression of rays of light were recorded through an electrical current on a second mirror. It now appears that Professor Graham Bell, the inventor of the telephone, has deposited a sealed patent for "seeing by telegraphy," and no sooner has the announcement been made than two gentlemen—Mr. John Perry and Mr. W. E. Ayrton—have rushed into print to proclaim how three years ago they made experiments in a similar direction. They state that the apparatus for receiving the light impressions and transmitting them electrically consisted of a large surface made up of very small separate squares of selenium. One end of each piece was connected by an insulated wire with the distant place, and the other end of each piece with the ground, in accordance with the plan commonly employed with telegraph instruments. The object whose image was to be sent by telegraph was illuminated very strongly, and by means of a lens a very large image thrown on the surface of the above transmitter. This is obviously the same plan adopted by Dr. Licks, and should Professor Bell's "sealed patent" turn out to be another modification, a very pretty triangular duel may be expected, that is, if the discovery has any practical value. By the way, it may not be generally known that our American friends are diligent students of our lists of patents, and many a notion which some ardent inventor patented in the full flush of his enthusiasm years ago, and could not complete, has been taken hold of by an ingenious Yankee, perfected, and reproduced as a novelty.

CANARY MEDIUM v. RUBY GLASS.

BY THOS. CHARLES BRIDGES.*

Having used ruby glass in the preparation of my dry plates, and also for dark room manipulation for the past two years, with very great discomfort to myself, and having seen so much written in the journals in praise of the ruby glass, it set me thinking if something better could not be brought out, as from my own experience I have come to the conclusion that ruby glass is very injurious to the eyes. After experimenting some time, a thought struck me as to the nature and colour of bromide of silver in gelatine, which you all know is of a canary green colour. I thought perhaps a light of the same colour might prove beneficial, so I started to work in that direction by testing the medium in daylight and artificial light. After several experiments, I came to the conclusion that the old ruby will be snuffed out, or, in plainer words, will become a thing of the past.

Having used the colour of light produced by the above with great comfort to myself, and likewise with greater safety than two or three thicknesses of the almost defunct ruby, I can confidently recommend every photographer to try the above colour, and I feel assured that any one who once uses it will never again even look through a piece of ruby, because the contrast is so great, between the two lights, that it is like working in the bright sunlight, compared with working by moonlight. Just as an illustration of the two lights on the eyes, I may mention that a friend of mine called in one evening, and stayed with me a couple of hours under the ruby. I saw him two days after, and he said:—"I have felt, ever since I left that dark room of yours, as if I had been walking round the North Pole, with the Aurora Borealis shining in my face;" and I could never persuade him to come again while I had the ruby light; but since I began to work with the above colour, he comes frequently, and he says now that he could stop a month with me, and it would not have the slightest effect on his eyes. Therefore I think that if once used, it will always be used.

I shall send a piece of the medium to the Editor, accompanied with a drawing of the lamp.

* Read before the West Riding of Yorkshire Photographic Society.

At Home.

MESSRS. W. & D. DOWNEY AT EBURY STREET.

Some people may suppose that the Messrs. Downey reserve to themselves the right of only photographing titled personages; this is a mistake. A circular published by them certainly conveys the idea that "anybody, as calls himself anybody," must perforce be portrayed by the famous Newcastle firm which has now established itself in the neighbourhood of Buckingham Palace; but Messrs. W. and D. Downey are really not averse to take any of Her Majesty's subjects any more than the Queen herself. Indeed, we may go further, and say that on comparison Messrs. Downey's charges will be found to be less in some respects than those of other fashionable portraitists. You may tender a guinea at Ebury Street without giving offence, but for this guinea you can only command one pose; for every additional position an additional charge is made, so that perhaps in the end the fees are much the same as elsewhere. The new Promenade or Panel portrait naturally enough commands the highest prices, and for six of these £3 3s. are asked. Cartes are one guinea the dozen—but you have only one position—and cabinets are charged double; as a matter of course, the fees are paid before the pictures are taken. The Panel portrait is certainly making way, the one drawback being, so we are told, that it can only be used for standing portraits.

Messrs. W. and D. Downey occupy two modest little houses in Ebury Street. The showrooms, which are also exceedingly modest and simple in their nature, are on the ground-floor. The public pass straight into them from the street, and to get to the studios and dressing rooms there are but eight or ten steps to mount. The studios are, therefore, easily come-at-able. We have no need to speak of the excellence of the work of Messrs. Downey; their staple is evidently the Cabinet portrait just now, and these are executed, as our readers know, with high skill and artistic finish. At No. 61, Ebury Street, there are two studios, and at No. 57 one glass room, which is only just completed.

This new glass room is a very fine building. It faces, or rather its entire length does, due north. It measures 42 feet by 14 feet. One side is a blank wall with a single window; the other three sides and roof may be described as entirely of glass. But it is all ground glass, and the soft illumination thus secured is simply delightful. That portion of the roof which faces south has white boards screwed over it, which boards may be removed, one or all, at any time in winter or dull weather; but it may be taken for granted that they will be a fixture under general circumstances. Wood is said to be the coolest roof that can be secured; but there is, of course, ample ventilation provided. Backgrounds, properly speaking, will be eschewed, and the studio fitted up as much as possible to represent a light drawing-room. The plaster wall is painted a French grey, which almost resembles a lavender, and a panelling of ground glass runs right round the skirting. Curtains running across the apartment and moveable screens permit of casting any shadows that may be desirable, but it will be Messrs. Downey's aim to photograph their models standing in front of a ground glass window at one end of the studio. The light coming through this background window is, of course, very subdued, but it will give a wonderful effect of relief, and represent the model as standing beside the window of an ordinary drawing room. On either side of the window are moveable door-like screens to aid in effect. At the other end of the studio the glass is not seen, by reason of a practicable screen or partition that has been erected, but a door in this partition may be opened to permit a model to stand, who will thus be lighted up as if in a doorway or in an opera-box, &c. As we have said, there is not one atom of clear glass about the studio.

It is just sixteen years ago, Mr. Daniel Downey told us, since his brother and himself were called to Balmoral for the first time by order of Her Majesty; and although no one will deny that the firm has enjoyed opportunities which others have not been so fortunate as to secure, it must be remembered that it is not everybody who knows how to make good use of an opportunity. At that time there was no accommodation to be had near the Castle and grounds, and the brothers were glad enough to shelter themselves and their apparatus in a labourer's cottage. But they did not want for personal comforts, for hardly had they arrived than the Prince of Wales, knowing of the strait the photographers were likely to be in, drove over in a waggonette to see them, and good-naturedly sent up provisions and wine at once for their especial behoof. The reception turned out to be one of good omen and is likely to remain in the memories of Messrs. Downey many a long day.

Everybody has seen the portrait of the Earl of Beaconsfield in a black velvet coat taken by Messrs. Downey. It was not an easy portrait to secure, and it was taken, it appears, some nine years ago at Balmoral, when the ex-premier's name was not Beaconsfield, but Disraeli. The Messrs. Downey had just completed a spell of work at the Castle, and had made arrangements for a few days' tour in the Highlands before returning to Newcastle. Accidentally the Premier ran down to have audience of Her Majesty, and the brothers had to be recalled from their pleasuring on purpose to photograph Benjamin Disraeli. Back they came, and in the morning Mr. Disraeli walked into the improvised studio in a coat of azure blue and light trousers. They tried and tried again, but the photographs did not please. It had been difficult before, to persuade the Premier to sit for his portrait, but he resisted all importunities the next day. Lady Churchill did all she could, and only when the stubborn First Lord heard that it was Her Majesty's keen desire to secure a portrait, did he consent to sit once more. Unfortunately, it was a dull rainy morning, and the natty velvet jacket in which he was now arrayed was a source of constant anxiety to Her Majesty's Chief Minister; a few rain drops might spoil its gloss beyond redemption, and this care, together with the long exposures necessitated by the dull light, again prevented the photographs being successful. The fruits of the second day were no more satisfactory than those of the first. As to suggesting further sittings on the third morning, it was more than any one who valued peace of mind dared do. There was the Premier still at Balmoral, walking about the grounds, but who was to ask him? At last, Lady Churchill plucked up courage, and spoke once more to the First Lord of the Treasury. He was obdurate at first, but in the end he consented to give five minutes, but only five minutes. He appeared again in the velvet jacket, and in a very bad humour; but the negatives secured on that occasion have become famous. Hundreds of thousands of prints have been circulated, and the negatives have been printed in silver, carbon, enamel, and both woodburytyped and collotyped. It was some time afterwards before the Messrs. Downey consoled themselves for the loss of that Highland holiday of theirs, but they seem now, at any rate, to have quite got over the disappointment.

Messrs. Downey's printing for the most part is done at Newcastle, where also all the pictures for publication are mounted and finished; but some work has, of course, to be completed in town. All negatives for private customers, which are not required to stand so much wear and tear, are retouched after they are varnished, but in the case of popular portraits the retouching is first done on the film, which is then varnished. For washing prints, white earthenware utensils are employed, for much stress is laid on cleanliness in Ebury Street, and this is obviously secured by having utensils that show the dirt very plainly. All negatives are stored, packed in brown paper, and not loose in racks.

By request of the Queen, the ex-Empress of France recently sat to Messrs. Downey, and our readers will understand at once that it is not unlikely a good portrait has been secured, since thirty negatives were taken of Her Imperial Majesty in an hour and a-half. These new pictures, our readers will be interested to hear, are to appear in the new Promenade or Panel *format*, a step that will no doubt contribute to make the new portraits more popular.

Other illustrious subjects that Messrs. Downey have recently photographed are the two kittens that the Prince and Princess of Wales purchased from Mademoiselle Sarah Bernhardt last year; in company with their Royal mistress they make a very pretty picture.

We spoke on the subject of photographs of "Beauties" before quitting Messrs. Downey's famous establishment. The affair is by no means so simple as it seems. As a matter of course, no portrait is ever published without the full consent of the sitter, and we feel sure that this assurance of Messrs. Downey's finds an echo in every studio of standing throughout the country. But here is the difficulty. A lady gives permission to have her portrait published; as it is a very good one, and shows her in a favourable light, she has no objection if it does meet the public eye. Nay, more; probably the more frequently her picture is seen, the better she likes it. The photographers have taken much pains upon the portrait, and they proceed at once to print the negative. They do not issue the prints at once, for fear these may be copied, but wait until they can stock the market. Then the firm issues to the trade. Dealers in all parts of the country buy, and the portrait circulates everywhere. At this juncture, maybe, the lady repents of her decision, and comes post haste to Messrs. Downey, asking that the picture may be withdrawn. This is impossible; the matter no longer rests with the origianl producers. They may say, "Very well, we will not print another copy;" but this has not the effect of withdrawing the priut from sale. On the contrary, if dealers already in possession of prints get to know that a photograph is no longer printed, the price of it goes up at once, and very much is made of it; unscrupulous printers will set to work copying under the circumstances. In any case, the producers are not to blame. So far as Messrs. Downey are concerned, they have never published a portrait without the full consent of the model; but ladies, and especially those who are given to changing their minds should remember that a permission once given is not, as we have shown, so easily cancelled.

The next "At Home" will be "Messrs. Hills and Saunders, at Porchester Terrace."

STRAY THOUGHTS.

BY J. CROSTHWAITE.*

There being no paper for this evening, I thought that possibly a few stray thoughts and jottings might prove acceptable to fill the time. I have no novelties to introduce, and merely propose to jot down ideas as they occur. On looking over the annuals for this year, one is struck by the preponderance of articles on the emulsion processes and gelatine plates, and the various modes of preparing and working them. Dry plates are certainly the subject of the day, and have doubtless in some respects very considerable advantages, but, for all that, now that light weather is returning, the greater number of photographers will go back to the wet collodion process. But we must be duly thankful for the gelatine plates, for what we should have done without them the last winter, goodness only knows.

There is to my mind a pleasure in developing a wet plate

* Read before the West Riding of Yorkshire Photographic Society.

which a dry one cannot possess, and for ordinary work the old collodion process will for some time be superior to the gelatine, as I do not think that (with some few exceptions) the results are equal to the best wet work. The fact of the general inferiority is to some extent demonstrated by the oft-reiterated statement that such and such a negative is equal to a good wet plate. In the hands of many photographers the dry process is somewhat uncertain and variable, the general defect being want of printing vigour, or what some people term "pluck." This arises usually from over-exposure; for one dry plate under-exposed, there are a hundred over-exposed, and then the difficulties begin; a thin development intensifying with unstable salts, and probably, after all, a somewhat unsatisfactory result.

Again, the commercial samples vary much, one batch being considerably quicker than another, most makers producing two or more qualities or degrees of rapidity. And it would seem as if they got mixed, the ratios of exposure vary so much.

When the professional man can prepare his own plates, these difficulties may to a great extent vanish, and then we may discuss the policy of discarding the bath and its numerous appendages.

The easy and certain production of gelatine rapid plates will doubtless aid in the production of what may be called artistic studies; when the production of pictures, as distinguished from portrait studies, is in question, the rapid exposures will permit of more action in the figures. An excellent paper on this subject, entitled "Motive in Photographic Pictures," appeared in a recent number of the Photographic News, and is of value as suggesting what ought or ought not to be attempted in photographic art studies. But it is perhaps in landscape and general out-door work that both the professional man and the amateur will most feel the advantages of dry plates. I remember well, in the days of wet plates—that is, before rapid dry plates were known—what an incumbrance the dark tent or box, the bath and solutions, were, with the accompanying result of stained fingers and dress, owing to working in an unusually cramped space; how the carrying of all the impedimenta to the place desired, if a distant and somewhat inaccessible one, was just sufficient to take off the edge of the enjoyment; then the stifling work in the tent, which was partly compensated for by seeing the results as you proceeded; and then the fagging work of carrying the traps to the station after having done a good day's work. I well remember walking over the hills from the Washburn to Otley on one occasion with other photographic friends, after working hard all day—on a holiday, too—how disgusted we all were with the apparatus. Another advantage the dry plate has over the wet in landscape work is, that you are prepared to take advantage of any fleeting effect of light and shade, such as we often see in hilly districts, and if the sun should happen to be clouded when you are ready, you can patiently wait until it again illuminates the scene, without being harrassed by fears of your plate spoiling.

A day out with the camera, now, instead of entailing a great amount of physical labour, becomes a wholly delightful affair, when you can get far away from the "busy haunts of man," plant your camera by the side of some rippling stream, and, with a good companion and a choice cigar, seek out all the charming bits of landscape, with nothing to bother you save what you can conveniently carry; under these circumstances I know of no more delightful way of spending a holiday. Speaking of holidays reminds me of an occasion when gelatine dry plates were transformed into wet ones before the day was over. I was out with a birthday party, one magnificent autumn day, at a well-known place not many miles from Leeds, and we had taken a camera and dry plates with us, in order to secure a few of the many charming views with which the place abounded. We walked down the river-side amongst some of the most exquisitely tinted foliage I ever saw, and exposed several plates, returned to the hotel, dined, and then drove to a park some little distance away, where we anticipated some satisfactory work being done. Our first shot was at a group of the party on some ruined terrace steps; then we walked through the grounds like Dr. Syntax, in search of the "Picturesque." Just before us lay a beautiful lake, the surface so still and unruffled that the reflections were perfectly startling in their truthfulness, almost making you uncertain which was water and which sky. One of the party, somewhat in advance, who had the camera and plate-box slung across his shoulder, stepped on to the stone coping of the pond, with the remark, "I wonder how deep it is!" when lo! a sudden disappearance, and a loud splash, announced the fact of his departure in search of a reply to his inquiry. On rushing to the edge, there was our friend comfortably swimming about, pipe in mouth, the camera, dark slide, and all the paraphernalia of the day's work, floating on the surface of the pond. My first care was, of course, to pull out the too enthusiastic inquirer after information, and then to secure the wreckage, but the plate-box, being heavy, had gone to the bottom; however, a few bubbles rising, revealed its whereabouts, and it was eventually fished out, full of water. The half-drowned party was at once despatched to the hotel, and on his arrival the only dry clothes available were some of the landlord's, who was a man of somewhat extraordinary build and dimensions; and as our friend was rather below the average height, his appearance in a suit of clothes about twelve sizes too big for him was utterly ludicrous, and may be better imagined than described. I regret to say that he formed the butt for the unfeeling jokes of the company for the remainder of the day.

Such incidents as these, however, serve but as the *sauce piquant* which gives a zest to the pursuit of landscape photography. I recollect being myself the victim of a similar accident when crossing a rapid stream, the slippery stones forming a very precarious foothold, and seeing the companion of my ramble rolling on the grass, bursting with laughter at my unsightly appearance, as I scrambled out, looking very wet and very undignified.

There are scarcely any enthusiasts in photography but have some droll stories to tell of their rambles in search of the beautiful, as the most charming bits are frequently just those that are the most difficult of access. I think if a few of the gentlemen who take out their holidays in photographic rambles were to favour us with an occasional paper on their experiences, it would prove very interesting and entertaining.

"All work and no play," says the proverb, "makes Jack a dull boy," and I do not think it at all derogatory to the artist or the man to sometimes unbend, and leave the purely scientific track for a little genial relation of their experiences by flood and field.

One of the regular contributors to the pages of the "Journal" would seem to decry this sort of subject, and thinks evidently that photographic societies should deal only with strictly scientific or artistic matters; but I think an occasional recreative paper is not to be despised by way of relief from the constantly recurring chemical and optical formulæ.

The summer season is now coming on, and if each member who produces any landscape work were to bring proofs to our meetings, it would add greatly to their interest, and a system of exchange might be arranged which would be much valued by some of the members; in addition to which the exhibition of such productions might become so many lessons in art composition, and, if critically analyzed, would be valuable as a means of education.

I know that many of these remarks have been made again and again, but there still seems to be the necessity for urging them amongst the members of societies. We are too much afraid of (may I say?) exhibiting ourselves, so that there seems to be a lack of matter at most meetings; let us therefore try to prepare something for our next session that shall be of value, either scientific or artistic, and from which we may derive profit as well as pleasure.

FRENCH CORRESPONDENCE.

Greatly Increasing Use of Gelatine Plates in France—Prize Competition for Improvements in Photographic Materials for Travelling Purposes—Banquet of the Photographic Society of France on the 3rd April—Photography Applied to the Bioscope and Phenakistiscope—The Bioscope of M. Eugene Simmonar—Photographic Toys by M. Lipmann.

Greatly Increasing Use of Gelatine Plates in France.—The great development of the use of gelatine plates is increasing in France from day to day. The movement has now spread to the provinces, and I am acquainted with several portrait photographers who exclusively employ these plates. It is from England, however, that we have received the stimulus, as the numerous preparations which are sent to us from the same country contribute not a little

to the success of the movement. Not that the new process is destined to drive collodion emulsions and wet plates altogether out of the field, but there can be no doubt that it will occupy a prominent and valuable position among practical photographers, especially among those who devote themselves to out-of-door work, and among those who have a large number of customers, on account of the economy of time which is effected by the use of plates ready prepared, and possessing such great rapidity. There can be no doubt of the advantage to a photographer of having at hand the means for preparing his own plates, but it is no less true that the manufacture of particular kinds of preparations as a speciality is loudly called for. It will certainly be a valuable improvement, that he can provide himself with, and have always ready, plates of very great sensitiveness—plates which he has only to put into the camera to get an almost instantaneous negative.

Prize Competitions Arranged by the Photographic Society of France.—Our Photographic Society proposes to hold two prize competitions, one for improvements in photographic lenses, the other for the invention of thin and flexible sensitive pellicles. Both of these competitions must have the result of improving photographic processes, one in the direction of rapidity, the other in that of portability. I have already noticed the interesting experiments made by M. Stebbing, M. Ferrier, and M. Balaguy with the object of producing sensitive pellicles, or, more properly speaking, pellicular plates. The plan adopted by Mr. Warnerke, that of piling a certain quantity of sensitive pellicles upon tablets of zinc, each one being separated from the next by a sheet of perfectly opaque paper, although very good so far as maintaining the sensitiveness is concerned, does not appear to me to realise the conditions required. What we want is a means of replacing one pellicle, which has been impressed with an image, by another which is still sensitive. In the Photographic News of the 2nd April mention was made of some experiments for developing gelatine plates in open daylight. This is a result which it would no doubt be a great gain to realise; but what seems to me more interesting and of still greater value would be to invent some method analogous to that of the changing-box, which could be applied to pellicles. The discovery of some means of this kind is, I think, essential, in order that tourists may be enabled to carry with them a large quantity of sensitive pellicles, so as to substitute with ease one for the other, in placing them in the focus of the lens of the camera. A system of this kind would render much greater services than a method of developing in the open. There is, it is true, the plan of using endless pellicle, which can be rolled up at one end, and unrolled at the other. Mr. Warnerke has invented a special frame with this object, but it is still open to improvement so far as to make the tension equal and perfect, before it can be used with advantage. A sensitive pellicular plate implies a proper method for effecting change, otherwise our gain will be only a relative one. We should avoid the trouble of carrying a great weight about with us, but we should be deprived of the facility for changing the plates which the changing box affords us.

Banquet of the Photographic Society of France.—While speaking of our Society I must not forget to mention among recent photographic occurrences the banquet of the 3rd of April last, which was attended by a large number of the members of this valuable Association. It was intended to celebrate the 25th anniversary of the foundation of a Society which has never been backward in welcoming and fostering any improvement or progress in our art, whether the same was of home or of foreign origin. The proceedings were marked by great cordiality among the guests, but without the least sign of constraint or stiffness. M. Peligot, the illustrious president of the Society, was in the chair, and in proposing the toast of "Success to the Society" he made a speech alluding both to his distinguished predecessors Regnault and Balard, and to the eminent men who, with M. Davanne at their head, form the present executive Council, and whose exertions have contributed so much to place the Society in its present condition of success and prosperity.

Photography applied to the Phenakistiscope.—Now that, thanks to gelatino-bromide, it has become possible to reproduce the movements of animated objects with astounding rapidity, there is afforded the means of studying the laws of the motions exhibited by living creatures. After what Mr. Muybridge has effected in America, we seem to be able to realise the possibility of reproducing the actual movements of an object in motion, first by means of successive views of each phase of the movement, and next by reconstituting them in an instrument similar to the phenakistiscope. Up to the present this instrument has only been used with a series of drawings by hand, showing the object in what is supposed to be successive phases of a movement. Now the illusion will be rendered more complete when these actual phases themselves are reproduced by photography. It will only be necessary that the degree of instantaneity (if I may so express myself) shall correspond to a complete state of rest in any particular position of the movement.

Photography applied to the Bioscope.—M. Engène Simmonar has invented a kind of bioscope, in which a portrait is shown with the eyes sometimes open, sometimes shut. The illusion of the same person alternately awake and asleep is very perfect. To obtain this effect, the inventor takes a double photograph of a sitter in exactly the same position, only in the first the eyes are open, in the second closed. From these two negatives prints are taken, one on the right side, the other on the reversed side of the same sheet of paper, in such a way that the two images, when viewed by transmitted light, accurately coincide; this can easily be done by the carbon process. By means of a small instrument arranged for the purpose, the right and reversed side of the paper are alternately illuminated, and the face is seen with the eyes successively open and shut. Thus the illusion of a person rapidly winking can be perfectly produced.

Photographic Toy.—M. Lipman has applied an analogous principle to the production of trinkets, in which are set two photographic miniatures, something similar to those which M. Dagron used to make many years ago. For example, one of the miniatures represents a lady holding her opera glass to her eyes, the other is a portrait of the same lady without the glass. By means of a small button acting on a reciprocating motion, one image can be rapidly substituted for the other, and a very good illusion is obtained of the figure raising and lowering the opera glass. Effects of this kind are susceptible of any amount of variation. A large number of highly interesting applications of a similar description would appear to be open to gelatino-bromide plates, especially as their superiority over wet collodion plates, as regards sensitiveness, increases enormously the facility for obtaining the desired result.

Leon Vidal.

PATENTS.

Compiled by Mr. Des Vœux,
Patent, Trade Marks, and Photographic Copyright Office, 32, Southampton Buildings, Chancery Lane, London.

No. 1543. Benjamin Joseph Edward, of 6, The Grove, Hackney, Middlesex, "Improvements in Packing Photographic Plates, and in Appliances to be used in such Packing." Dated 15th April, 1880.

No. 1548. Andrew McCallum, of 47, Bedford Gardens, Campden Hill, Middlesex, "Improved Means of Exhibiting Pictures, Drawings, Engravings, Etchings, Photographs, and other Works of Art, or Objects requiring to be Viewed at Special Angles of Light." Dated 15th April, 1880.

No. 1569. John Clayton Mewburn, of 169, Fleet Street, London, "Improvements in or Applicable to the Colouring of Photographs." A communication to him from abroad by L. Favre, of Paris. Dated 16th April, 1880.

No. 1637. George Charles Bell, of Brooklyn, New York, United States of America, "An Improved Mode of Producing Photographs, more especially Designed for Use in the Production of Engravings, Lithographs, and other Illustrations from Nature."

The Photographic News.

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CONTENTS.

ON THE PROPORTION OF GELATINE TO SENSITIVE SALTS IN A GELATINE EMULSION.

Several correspondents have asked us the best proportion of gelatine to use in making gelatine emulsion, and we have thought that our own experience may be of use in helping them to arrive at the principles which should govern it. To begin with, as we have recently pointed out, there are various qualities of gelatine, commencing with the very fine and soft specimens, such as a Nelson's No. 1 photographic, and ending with carpenter's glue. Taking these two extremes, the quantity required for holding the sensitive salts *in situ* is very different in the one case to the other. Of the very soft kind probably not less than thirty-five grains to each ounce of washed emulsion would be required, whilst of the glue one-third of that quantity would suffice.

It is this fact that makes the formulæ given by various writers so misleading when the quality of the gelatine is not specified. For instance, we know some cases in which as much as fifty grains of gelatine were recommended to each fluid ounce of emulsion, and if any but the very softest sort were used, the resulting films would be almost impossible to develop. It may be taken as an axiom that the less permeable to water—that is to say, the harder—the gelatine, the more difficult is development, and therefore a less quantity will restrain the action of the developer; for it must be recollected that the great and useful sensitiveness of the gelatine emulsion is owing to the restraining power of gelatine on the activity of the developer.

Taking a good sample of medium hard gelatine, we find that about twenty grains to the fluid ounce of emulsion is sufficient; thus, with Nelson's flake gelatine, this is amply sufficient to hold *in situ* the silver bromide which is formed by adding twenty-five grains of nitrate of silver to an excess of some soluble bromide. But this is not a hard-and-fast rule, since the proportions may be somewhat altered if chrome alum be added to the emulsion. Chrome alum has the property, as no doubt our readers are aware, of hardening and toughening the film of gelatine, and the more added the harder and tougher does it become. The above proportions suffice when one-eighth of a grain of chrome alum is added to each ounce of the emulsion previous to coating the plate. If it be omitted altogether, three equal parts of nitrate of silver and gelatine may be advantageously used, whilst if the chrome alum be increased to a quarter of a grain per ounce of emulsion, the gelatine must be diminished to about seventeen grains to each twenty-five of nitrate of silver. When a very hard gelatine is used, there is the same apparent loss of sensitiveness as when much chrome alum is used with a softer sample, and we believe that the loss is more apparent than real, and is probably due to the physical qualities, and not to any chemical action of the gelatine or chrome alum, since by using means to soften the film the sensitiveness is at once increased in a very marked manner.

From the foregoing remarks it will be seen that, in our opinion, the softer the nature of the gelatine used, the greater will be the sensitiveness that can be obtained in a plate. Unfortunately, the great bugbear of the gelatine plate—frilling—comes to the front when the extremely soft specimens are used in practice; hence it is necessary to use either a mixture of a hard with a soft gelatine, or else one of medium tenacity. We believe that there is no theoretical limit to the sensitiveness of the emulsion, but the physical defects inherent to the gelatine on approaching it are so serious and so difficult to overcome that we believe practically we have come to a point beyond which we cannot travel much further. Chrome alum must always be used with caution, but it is almost a necessity to use it, in order to get plates which will stand the fixing solution, and we should say that with a medium strong gelatine, 1-20th of a grain per fluid ounce of emulsion is the maximum that ought to be required, and that never should more than half of a grain be used with any gelatine. If more be required to prevent frilling, a different sample of gelatine should be tried, and our advice is, that having found one which works well; a change from it should only be made if it can be demonstrated that some other specimen is very superior to it. We have said nothing regarding the unsuitableness of some gelatines owing to impurities found in them, as that is beside the question now treated of.

MR. EDWARDS' GLYCERINE DEVELOPER.

There is no question about it that Mr. B. J. Edwards has signally improved alkaline development by the addition of glycerine to the pyrogallic acid and ammonia solutions; the development is effected far more rapidly, and, what is as much to the purpose, you can watch well the progress of the image towards completion. We have had an opportunity of comparing it with the doings of two oxalate developers: the one made up and manipulated by Mr. Alexander Cowan, in that gentleman's laboratory; the other prepared according to Eder's formula, and worked by ourselves. In both cases the development was effected more quickly by the Edwards' formula than by the oxalate. The plates were similarly exposed, and put into developing dishes for a period of sixty seconds. In half that time the glycerine developer had acted with sufficient vigour; on the other hand, the minute scarcely sufficed to fully develop the plate in the oxalate dish. A further experiment with the Eder developer seemed to prove pretty conclusively that with plates similarly exposed, forty-five seconds of the Edwards' developer gave as vigorous an image as two minutes' development in the oxalate. The glycerine seems to allow the developer to come at once into intimate contact with the film, and to hasten the development in this way.

But while thus recognizing the very great service which Mr. Edwards has undoubtedly rendered to photography, we must still uphold the value of the oxalate developer. The glycerine modification will be invaluable for use under many circumstances, but the fact that the oxalate yields a negative so like a model wet plate, with the clearest of shadows, and lights of that delicate matt appearance photographers delight in, is obviously an advantage not easily over-rated. There is an entire freedom from brownness, which is so characteristic of a gelatine film developed with ammonia and pyrogallic acid. If a plate will develop within two minutes, and the coming image is capable of being kept during that time under observation and control, there is little else to be wished for.

Notes.

Her Majesty, the Queen, desirous of possessing a permanent portrait collection, has ordered carbon prints of the photographs in her possession.

The French Photographic Society celebrated this month the twenty-fifth year of their existence in a banquet at the Café Riche. Upwards of eighty members were present, and a resolution was passed to dine together annually.

It may be remarked that the twenty-fifth year of our own Photographic Society passed some time since. The first meeting of a preliminary character was held on the 20th January, 1853, under the presidency of Sir Charles Eastlake, and the Society was definitely formed at the end of the month. Of the gentlemen who took a leading part in the formation of the Society, only two now remain on the list of members, and these are Robert Hunt, F.R.S., and Dr. Diamond.

We hear, on good authority, that a well-known amateur, Mr. W. Webster, of Blackheath, "has positively taken a picture of a pigeon flying." Since some of our readers who have made merry over "gulls," and "swallows," and "canards" may be shy of being "pigeoned," we may state at once that Mr. Webster is not likely to make any secret about the matter, and will be, no doubt, quite ready to give frankly any details of his *tour de force.*

As already announced in our "French Correspondence," the Minister of the Interior of the French Republic has offered a prize of 2,000 francs for researches and investigations with regard to photographic lenses. A committee, of which M. Janssen is the President, has been appointed by the Photographic Society of France to draw up the conditions for the prize. Except as regards the results obtained, the competition will have no interest for English opticians, as it is limited to manufacturers of French birth, or resident in France. Competitors will have until January, 1882, to complete their task.

The Committee recognizes the general requirements for two separate kinds of lenses; there will, therefore, be two submitted in competition. One of these is to be of wide angular aperture—at least 100°—for landscape purposes; the other for pictures—such as portraits—not requiring so large an angle, but to be sufficiently accurate for deciding scientific measurements. Of the latter, the best will be considered to be that distinguished for qualities of giving straight lines and a flat and equally illuminated field; it must have a focal length not exceeding thirty centimetres, and must work with rapidity and clearness. Both lenses must be constructed to give pictures 18 by 24 centimetres, and must be as light as possible, so as to meet the requirement of portability. In other respects competitors will be allowed every latitude in the means employed to satisfy the conditions.

The Royal Society has made its choice—or, rather, the Council has, which comes to the same thing—in the matter of selecting fifteen gentlemen worthy to become Fellows. Dr. Attfield, Professor of Chemistry at the Pharmaceutical Society, is one of the elect, as are also Prof. J. E. Reynolds and Dr. W. A. Tilden.

The *Times* usually makes a muddle of it when it talks of photography; as the late Mr. Joseph Miller would have remarked, whenever our leading oracle opens his mouth, he puts his foot into it. In commenting the other day upon Mr. Jabez Hughes' fine portrait of Lord Beaconsfield, which Messrs. Marion have just published, we are told:—"The strongly marked features of the out-going Premier are such as the photographic art most successfully produces," which, if it means anything, is a reflection upon the way in which photographs always lay stress upon the wrinkles and crow's feet of the sitter. "Being printed in permanent pigments, it does not fade like an ordinary photograph," we are further assured, which is what Mr. Samuel Weller would term a very self-evident proposition.

The latest novelty in science is "seeing by electricity," or sending luminous pictures by telegraph. It may be simply explained in a few words. Selenium is a substance whose conductivity is materially affected by light, electricity passing more readily through if sunshine is permitted to fall on it. Supposing we have a surface made up, mosaic-like, of small cubes of selenium, and connect to each cube an electric wire, we should get an instrument proper for the transmission of a light picture. The whole surface in shadow, all the cubes would send a current along their respective wires (if they were properly connected with a battery) of precisely the same strength. If, however, a luminous image, such as the figure of a cross, were thrown upon the mosaic surface, those little cubes which became illuminated would at once have their conductivity increased, and a stronger current would run along the wires in connection with them. Now let us follow the bundle of wires, and look at the other end of the line. The receiving instrument which is to have this bright cross repeated upon it is a piece of ground glass. Behind this ground glass are a lot of little squares, which prevent the light getting to the glass, each square corresponding to the squares of selenium at the other terminus. The bundle of wires terminate in a lot of little magnets—or, rather, electro-magnets—which come close up and nearly touch the squares behind the glass. If a strong current of electricity comes along one of the wires, the electro-magnet acts and attracts one of the little squares, and in this way a square of light is admitted to the ground glass. When, therefore, the bright cross of light falls upon the selenium at the one end, a number of electric currents are transmitted, and in like manner a number of little squares are attracted by electro-magnets, and thus light is let in upon the glass plate, the illumination being naturally of the same extent and form at the receiving station as it was at the transmitting one.

A Fish and Fishing Exhibition opened at Berlin last week, to which the English, according to the *Daily News*, have made but scanty contributions. What has become, we wonder, of the late Mr. Crawshay's valuable collection of piscatory portraits that used to hang in Cyfarthfa Castle and at his Fishing Cottage on the Usk? They depicted very vividly the ordinary and extraordinary phases of the salmon, trout, eel, &c., and would have constituted an important exhibit in a collection like that of Berlin.

Dr. J. Schnauss, of Jena, whose contributions to photographic chemistry are well known, has discovered a simple method of recovering silver from the hyposulphite bath in a metallic form; but he delays publishing his method for the moment.

A recent number of a French contemporary contained the startling assertion that M. Cornu had presented to the Academy of Sciences a communication by a M. *Habeneck*, announcing his discovery of certain substances sensitive to the ultra red rays of the spectrum. Jealous for the right of priority for our own countryman, Captain Abney, we at once called his attention to the paragraph which, as we imagined, threatened to deprive him of the honour of a discovery with which his name has been associated. Great, then, was our astonishment to learn that the communication presented to the French Academy by M. Cornu was that of the gallant captain himself. The editor of the *Revue Photographique*, with the usual perversity of the French intellect where English surnames are concerned, had converted Abney into Habeneck.

Colour blindness among railway servants is attracting serious attention in the United States. An Act has been passed in Connecticut which provides for the infliction of penalties on any railway company employing a person who is not in possession of a certificate of freedom from colour blindness. This is pushing matters very far; although it is true that, on examination, many railway servants have been found to possess slight defects of vision, it has never been proved in one single instance, we believe, that an accident has been due to mistaking one colour for another. As was remarked at the Genoa experiment, to which we alluded the other day in our columns, a green light may be taken for white at a long distance, but to the most defective eyesight the red danger-signal never appears the same as white or green.

We see that Professor Borlinetto, of Padua, employs collodion in the construction of the electrophorus; cardboard is coated with collodion, and when this surface is rubbed, considerable electric action is generated. If the professor will try collodion with a substratum of india-rubber, he will find that by rubbing it, more electricity still will be evolved, as witness the Warnerke film, which is simply the most electrical body we know of. Certainly the means are here at hand for the construction of a very simple and powerful electrical machine.

Topics of the Day.

THE MODERN PREPARATION OF GELATINE PLATES.

BY WILLIAM BEDFORD.

Although much has been already written on the preparation of gelatine plates, now that the value of the process is so universally recognised I venture, even at the risk of saying too much about a good thing, to give an epitome of the manipulations which I have found to give the best results. At the same time I cannot claim much originality for the method I advocate, but thankfully acknowledge my indebtedness to those numerous experimentalists who have so generously placed the results of their labours before the photographic public.

The name of Mr. C. Bennett will always rank high in connection with gelatine emulsion, as he was the first to show what the process, when worked according to his directions, is capable of; thus giving that stimulus to rapid photography which the profession at large, as well as his fellow amateurs, are now profiting by. But the method which, with slight modifications, has now almost wholly superseded Mr. Bennett's—namely, emulsification at a high temperature with a small proportion of gelatine—is, in point of fact, of much older date, having been published as long ago as September, 1877, by Mr. William Aston, who rightly credits Mr. W. B. Bolton with the first conception, nearly four years antecedent to that date, of the happy idea of forming the silver bromide in a weak solution of gelatine, and himself contributes the other element of rapidity—high temperature.

This process does not seem, however, to have attracted much attention at that time, nor was its true value then thoroughly realised (unless it were by one or two commercial firms), but there is no doubt that plates of the highest degree of sensitiveness may be produced by it in a few hours, which by Mr. Bennett's process would have involved a long and tedious method of preparation extending over several days.

Proceeding to the manufacture of the emulsion, the first requisite will be to obtain an efficient light to work by. An argand gas-burner, or a petroleum lamp provided with a deep ruby chimney, and an additional screen of paper, deeply stained with aurine, surrounding it, care being taken to intercept all light which does not pass through the coloured media, will be trustworthy, if kept at a reasonable distance from the sensitive emulsion and plates.

The formula for ten ounces of emulsion will stand thus:

No. 1.

French gelatine	20 grains
Ammonium bromide	110 grains
Potassium iodide	10 grains
Ammonia ·880 sp. gr.	2 minims
Water	2 ounces

No. 2.

Silver nitrate	200 grains
Distilled water	2 ounces

It will be seen that I have introduced a small proportion of iodide, as there is no doubt, as Captain Abney has recently observed, that it greatly tends to preserve the brilliancy of the shadows, and thus enables us to use the emulsion in a more sensitive state than we could otherwise do without fog. It also has the valuable property of preserving the due gradations of the more highly lighted portions of the subject, or, in other words, prevents solarization, which bromide films *per se* are liable to.

The gelatine must be swelled in the two ounces of water in which the bromide and iodide are dissolved; the two solutions are then heated to 150° Fahr., and No. 2 added very gradually to No. 1. With this object the silver solution is poured into a small glass funnel (the stem of which has been drawn to a fine orifice), while it is supported over

the vessel containing the bromized gelatine, which must be briskly agitated by any convenient means. I use a bottle-brush made with silver wire, which is kept working up and down during the process of mixing, and thus thoroughly incorporates the two solutions. When the whole of the silver solution has been added, a small quantity of the emulsion may be poured on a slip of glass, and examined by the transmitted light of a gas flame; if the flame appear of an orange yellow colour, the emulsion will have been properly mixed; but if of a cold grey or blue tint at this stage, it shows that the operation has been too hurriedly performed, and the result will not be satisfactory.

In this process the sensitiveness, as far as our present knowledge of the subject goes, greatly depends on the state of division in which the silver bromide is formed. If the gelatine be present in too large proportion, or if the solutions be too weak, the molecules of silver bromide will be finer, and no amount of subsequent boiling will give the same degree of rapidity. On the other hand, if a smaller quantity of gelatine be used, or if the solutions be too strong, the resulting bromide will be too coarse, and fog will ensue. The quality of the gelatine, too, has a marked effect on the subsequent sensitiveness of the emulsion.

The thin but smooth emulsion may now be transferred to a stoneware bottle, and the whole placed in a saucepan of boiling water, where it should be kept boiling for thirty minutes. It is then strengthened up by the addition of 250 grains more gelatine (which has been previously soaked in water and drained), and filtered into a dish to set. With regard to the gelatine to be used, it is necessary, especially in warm weather, to select a moderately strong sample. Nelson's photographic I have found to be too soluble, unless mixed with a firmer kind, such as "Coignet's Gold Medal." On the whole, I have found the French gelatine, sold in sheets, answer best. When thoroughly set, the pellicle is broken up into pieces, and passed through a syringe, having a disc at the end pierced with holes, into a hair sieve standing in a vessel of clean water, which is kept running during six hours. The washed emulsion having been remelted, and filtered through swansdown calico, the plates may be coated without warming, and the addition of alcohol is generally found to be unnecessary, unless the emulsion has to be kept before use; but in any case it is best used fresh.

It is convenient, after the plates have been allowed to get thoroughly set on a level plate of glass, to transfer them to a closet, and dry them by a current of warm air, or they may be put direct into the drying cupboard on levelled bars; but the heat will be liable to induce frilling during development, unless a small proportion of chrome alum, two drops of a sixteen-grain solution to each ounce of the washed emulsion, has been added previous to coating. Chrome alum must, however, always be added sparingly, as otherwise it renders the films impervious to solutions.

These plates, if successfully prepared, are extremely rapid, an ordinary landscape subject, with lens aperture $\frac{f}{15}$ requiring less than one second's exposure. Portraits may be taken in the studio in the fraction of a second.

For development, I generally use alkaline pyrogallic, though the recently introduced modification of the ferrous oxalate developer gives equally good results if the exposure be correctly timed.

A convenient formula for pyrogallic development is the following:—

No. 1.

Pyrogallic acid	60 grains
Nitric acid	8 minims
Water	20 ounces

No. 2.

Ammonia ·880	2 drams
Ammonium bromide	75 grains
Water	20 ounces

These two solutions will keep good for a considerable time, and should be mixed, immediately before flowing over the plate, in equal parts, or the proportions may be varied to suit the exposure.

If intensification should be required, it may readily be effected by Dr. Van Monckhoven's method, which consists of treatment with bromide of mercury followed by a dilute solution of pure cyanide of potassium saturated with cyanide of silver. This process, in my hands, has given excellent results, and great promise of permanence.

I conclude by expressing the hope that any who may be induced to give the above a fair trial may succeed in producing uniformly satisfactory results. Constant improvements are being made by those who are working in this direction, and it is only fair to believe that each one who continues the work may contribute something, however small, towards perfecting a process which seems destined, sooner or later, to eclipse all its predecessors.

The Topic for next week will be "The Nitrate Bath—How to Make and Keep it in Order," by Mr. Valentine Blanchard.

SIGNALS BY SUNSHINE.

The solar ray is getting the better of the electric spark in the conveyance of signals; sunshine is beating the voltaic pile as a fleet and convenient messenger. The news of the last great battle in India comes to us in rays of sunshine, flashed by mirrors across a hostile country, and the heliograph is now as firmly established as the electric telegraph. One of these days we shall have a camera arrangement for recording the light flashes, and thus, with mirrors and photographic apparatus, signals will be capable of being written down and recorded at a distance of fifty miles. General Stewart could not have carried with him electric wires sufficient for a long line of communication, and even if he had established such telegraph communication, military posts at frequent intervals on the road would have been necessary to protect it. The heliograph, on the other hand, does not require the route to be kept open. The line of communication cannot be cut, for the simple reason that the signalling takes place over the heads of the enemy, and the stations required are but few and far between. A ten-inch mirror—and this is the diameter of the ordinary field heliograph—is capable of reflecting the sun's rays in the form of a bright spot, or flare, to a distance of fifty miles, the signal at this interval being recognisable without the aid of a glass; that is to say, two trained Sappers, each provided with a mirror, can readily speak to one another, supposing the sun is shining, with an interval of fifty miles between them, provided their stations are sufficiently high, and no rising ground intervenes to stop the rays. The adjustment of the military heliograph is a very simple matter. An army leaves its base where a heliograph station is located, and after travelling some miles desires to communicate with the stay-at-homes. A hill in the locality is chosen, and a Sapper ascends with his heliograph, which is simply a stand bearing a mirror, swung like the ordinary toilet looking-glass, except that besides swinging horizontally it is also pivoted so as to move vertically as well. Behind the mirror, in the very centre, a little of the quicksilver has been removed, so that the Sapper can go behind his instrument, and look through a tiny hole in it towards the station he desires to signal. Having sighted the station by adjusting the mirror, he next proceeds to set up in front of the heliograph a rod, and upon this rod is a moveable stud. This stud is manipulated like the foresight of a rifle, and the Sapper again, standing behind his instrument, directs the adjustment of this stud until the hole in the mirror, the stud, and the distant station are in a line. The heliograph is then ready to work, and in order to flash signals so that they may be seen at a distance, the Sapper has only to take care that his mirror reflects the sunshine on the

stud just in front of him. He may then be quite sure that his distant brothers can see them too. If he shows a light for a short time—say two seconds—he means a short signal; if for six seconds, a long signal; and the alphabet is simply a combination of these long and short signals.

PRINCIPLES OF OPTICS INVOLVED IN LANTERN CONSTRUCTION; AND ON A NEW ENLARGING LENS, ESPECIALLY DESIGNED FOR USE WITH THE MAGIC LANTERN.

BY J. H. DALLMEYER, F.R.A.S., ETC.*

The commercial condensers may be comprised under two heads, viz., the so-called "Herschel" form,† composed of a plano-convex, or a concavo-convex combined with a double convex, the flat or concave side facing the radiant, the lenses of 4 in. diameter and 3½ in. equivalent focus; and the symmetrical condenser of 3½ in. and 3 in. focus respectively, and of the same diameters. I am disposed to give the preference to the latter form, resembling to some extent the Ramsden eye-piece, though this admits of improvement, as I shall show further on.

The essentials, then, of a good condenser are "quantity and quality of light." The former points to diameter and focal length, the latter to perfection of the glass and correction of aberrations of the lenses.

The condenser constructed by me for Mr. Hardwich is of 4 in. effective diameter, and 2¾ in. equivalent focal length. Assuming the radiant to be at a *safe* distance of 2¾ in. from the flat surface of the first lens, this condenser collects an angular pencil of about 66°, *i.e.*, about 20 per cent. more light than the shortest focus symmetrical. It is represented by Fig. 3, and consists of the two unsymmetrical lenses, A and B. A is a plano-convex of flint, 3⅝ in. diameter, and B is a double convex of crown-glass of 4 in. diameter. The lenses are mounted at a certain interval apart, and their deep sides facing each other. Approximate correction of chromatic aberration for centrical pencils is obtained by a proper apportioning of their focal lengths and the distance at which they are placed. Thus: ray L R, after refraction by lens A, diverges into a prismatic beam; this falls upon different parts of the lens B, which, while acting upon the two extremes—the red and violet—in contrary directions to A, causes them to emerge parallel, the condition of achromatism, when they converge to the conjugate focus *f*, about 9 inches removed from B. The spherical aberration is reduced to a minimum by the forms of the lenses employed, *i.e.*, ray L refracted by the central portion of the lenses meets the axis at the same point, *f*, as the marginal rays, or nearly so.

I have decided upon a 4 in. (effective) diameter condenser, since it fully illuminates the corners of a 2¾ in. square slide. Of course a circular slide of 3 inches only requires a 3½ inch diameter condenser, of proportionately shorter focal length.

I need hardly say that the glass composing this condenser has been selected with especial care. It is perfectly limpid or colourless, and will remain so; it is free from *striæ* and air-bubbles, and has a perfect polish. In fact, it is Chance's best glass; the only drawback being its cost.

And here I would remark that any defects in the glass of the condenser are far more detrimental, as regards the purity and quality of the illuminated disc, than similar defects in the objective.

I pass on to the enlarging lens, or objective; for however perfect the radiant and the condenser, the all-important thing

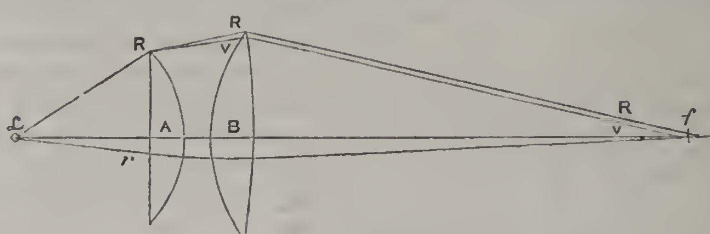


Fig. 3.

for a perfect picture on the screen is the lens by which it is produced. Of these I have the honour of submitting two specimens especially constructed for the purpose. Before I describe the new lens, I will briefly refer to those which have been used for the purpose up to the present time. There are the old so-called lantern "fronts," comprising various single or achromatised lenses, that are made to screw one upon the other, giving all sorts of sizes and shapes of pictures, but devoid of almost all correction. These "toy" lantern appliances are, however, no longer in vogue with photographers, or, indeed, with any one who appreciates definition, freedom from distortion, &c., and hence came the substitution of *portrait* lenses for the old lantern "fronts." Those now supplied with the better class of instruments are generally French quarter-plate lenses; most deficient, however, in respect of three very important particulars, viz., flatness of field, straightness of lines, and illumination. The former are seen at a glance upon the screen, not so, however, the latter; and in order to illustrate my meaning, I must (not to multiply diagrams) once again refer you to Fig. 2, representing the commercial 4 inch condenser of 3 inch equivalent focus; the radiant at a distance of 3 inches with its subjugate of about 10 inches, as at *f*. To collect and to transmit all the light at a distance of 4½ inches from the slide, as at O, requires a lens of 2 inches diameter in the clear. Upon examination of the French quarter-plate lenses of 4½ inch back focus (6 inches equivalent) it will be found that the lenses are of barely 1⅝ inch diameter, and this diameter, squared, affords the information that only about one-half of the light from the condenser passes through the lens on to the screen. It may suggest itself, why not shorten the focus of the condenser by removing the radiant to a greater distance on the other side? The case is represented by the dotted lines, and it will be observed that for a shorter focus, as at *f*′, the radiant moves to L′. It is true the lens O′ now transmits all the light from the condenser, but this in turn receives less from the radiant, owing to increased distance; hence, what is gained on one side is lost on the other, and the result is the same. Perhaps the balance of advantages is on the side of the latter expedient, since it excludes diffraction-phenomena.

Then, again, it may be asked: why not use a longer focus objective which includes all the light from the condenser? Take an extreme case represented by O², *i.e.*, a lens of double the focal length of O. This, of course, includes all the light even from a larger radiant than a point; but observe, in order to get the same sized enlargement the screen must be moved to double the distance, and the resulting picture appears dimly lighted. It possesses only one quarter of the illumination of teh former.

(*To be continued.*)

* Continued from page 196

† I deem it right to state that the late Sir John Herschel never designed the forms of lenses called by his name as a "condenser." He proposed it as a "burning lens," the spherical aberration being approximately corrected only for the sun, or for *parallel* incident rays; as expressed in a letter addressed to the writer by the late Sir John, in February, 1867.

SILVER PRINTING.

BY JOHN MATTHEWS.

Mr. J. Spiller's paper must have struck a new chord in the breasts of many photographers relative to the fading of silver prints. There are those who argue that sitters do not require permanent productions—that they are only too eager to "come again." This sentiment, as far as I can discern, is confined to a very small proportion; for the most part certain young gentlemen who experiment

on the growth of the adornment of the upper lip, and maidens who squint. After thirty, few sitters are disposed to be off with the old love and on with the new; the photograph taken before that age is the favourite one with them, and with it they require, it is obvious, permanency. To gain this end, I make no doubt, the mounting of prints will, for the future, be an important consideration. Washing also will receive its proper share of attention, and the two combined ought to act greatly towards that end. But the question still remains, how is the permanency of silver prints to be tested? It would certainly put our present suppositions at naught if we discovered that some of the prints most perfect after keeping were mounted on cards which contained injurious matter, or that some faded ones were on cards that were pure. I would humbly recommend to Mr. Spiller a few researches in this direction. What we require is a standard of analysis whereby we can say, if a silver print is free of certain impurities, it must be permanent. Or, failing in this direction, a something to be introduced into one of the manipulations, or made a separate operation, by which the same object is attained. If a scientific gentleman would devote his labours to this end he would prove a benefactor to the profession, and would be to it even a brighter "star" than Monsieur Lambert. This done, he could patent his discovery, and retire with more substantial rewards than fame would give. No "process" yet invented has the ease and sureness of silver printing, and it would be an act of the basest ingratitude to give up such an old and tried friend without a few desperate efforts. Before we put it and its ally, the silver bath, on the shelf as done up, decrepit, and useless, let us be sure that we have not left some rich and workable vein undiscovered. We ought not to cast aside our respect for the aged warrior who has defeated so many youthful rivals. Let us turn our energies vigorously to that which will cause it to still maintain its ground against many newcomers—permanency.

Correspondence.

PAYMENT OF ASSISTANTS.

Sir,—In reference to the letter of "An Operator of Six Years' Standing," in the News of April 16, I can, at any rate, give one instance of suitable assistants being suitably paid. In one of the studios described early in your series of "At Homes," there is, to my knowledge, a gentleman who is employed as assistant, under a three years' engagement, at a salary of £10 a week. I can give you other instances of photographers paying their assistants well, if you want them.—Faithfully yours, An Employer.

Sir,—In your issue of April 16, under above heading, a correspondent who styles himself "An Operator of Six Years' Standing" appears compelled to ask "what you think are fair wages for an operator." A most important question, undoubtedly, if asked by a person who had set his mind upon operating, and was anxious to embark his cargo of talent and ability upon the tide of photographic enterprise; but when asked by an "Operator of Six years' Standing" is suggestive of the conclusion that there are operators and *operators*. Your correspondent's further description of his abilities in detail, however, leads one to see that he is no more than a "general assistant," for the term "operator" (I cordially agree with your dislike of the term, but while the gods are preparing one more suitable I employ it) ought never to be used as descriptive of any one who cannot take a good negative, aye, and make the most of a bad one, for that is a prime quality, as every operator of ability will readily admit. I have high hopes of your correspondent, for though he candidly admits that "he has not retouched much," he quickly adds, "I can soon learn it," and any one who can soon learn retouching, and will combine that, apart from portraiture, with "printing and toning very well," will soon find thirty shillings per week poor remuneration for the display of such varied abilities. But why, Mr. Editor, why did you not advise him to learn portraiture? You say, *when* you can take a good negative. Why not advise him to do it? Why indeed! Ah! there's the rub. And here I leave your correspondent while he investigates the philosophy of your silence, with the hope that when he has sounded its depths he will not fail to forward his conclusions to you.

The payment of assistants is a subject which has been brought very prominently under my notice. Having passed through the successive stages of pupil and assistant to that of employer, I have seen various phases of this subject, and have had ample opportunity of making notes—mental ones, I mean—and have formed conclusions from which I am not likely to be easily moved. In my judgment a really firstrate assistant can command high wages. When compared with many professions in the commercial world, such an assistant, be he retoucher, colourist, operator, or printer, is in receipt of wages that give him a status in society of which he need not be ashamed. The difficulty with employers, I am sure, is not to find men worth five-and-twenty or thirty shillings per week—they may be taken in shoals almost every week—but to find men of talent and enterprise—men up to the times, whose services they would be only too glad to avail themselves of at three, four, or five guineas per week: there are but very few such found to be disengaged. An assistant really competent in receipt of high wages knows when he is well off. He is not a reed shaken with the wind. His voice is heard in the councils of the business; moreover, and though nominally employed, his position is such that he knows perfectly well that unless endued with fair administrative abilities, even a business of his own would not compare at all favourably with it. As assistants, I have known many get on remarkably well, but as masters they have soon tumbled to pieces. I have no wish, however, to check enterprise, I am only desirous to add caution; these are not the days in which new businesses take so well as was the case twelve or fifteen years ago, and assistants who have a good berth will be wise in looking at every side of the subject before they launch out into the deep.—Very truly yours, J. Kay.

BROMO-IODIDE FORMULA.

Sir,—If Captain Abney would kindly give his bromo-iodide formula he would confer a great benefit on many amateurs who, like myself, have very little time for experiments.—I am, sir, yours truly, Bach.

Proceedings of Societies.

Manchester Photographic Society.

The usual meeting of this Society took place on the 8th instant at the Memorial Hall, Albert Square, Mr. Charles Adin, President, in the chair.

The minutes of the previous meeting having been read and passed, Messrs. Edward W. Mellor (Prestwich), E. Holding (Tottington), and J. J. Rishton (Haslingden), were elected members; after which the Chairman read a note from Messrs. Mawson and Swan, regretting the inability of Mr. Swan to attend the meeting.

Mr. Kershaw exhibited a number of negatives on "Peveril" plates, and prints from the same.

Mr. Thomas Sefton handed round six beautiful negatives taken on gelatine dry plates. He explained that they were the first gelatine plates he had prepared, and that he was indebted to Mr. R. Atherton for the formulæ and details of the process.

Mr. W. G. Coote exhibited two large collodio-albumen plates, with unusual peculiarities when developing. At the stage of "cotton wooling" the image rubbed off, which he discovered was entirely on the surface of the film, and the slightest touch only was necessary to remove every trace of the picture.

Mr. George Wardley stated that the collodion used must have been of a very powdery nature; and in the general discussion which followed, he (Mr. Wardley) said that for collodio-albumen plates he preferred a simply iodised collodion in preference to bromo-iodised, as he had found that when a bromo-iodised collodion was used the bromide of silver was converted into iodide of silver upon the application of the iodised albumen.

Mr. Chapman exhibited two 8½ by 6½ tourists' cameras, made by Mr. Lane, of London, and an instantaneous shutter. Mr. W. J. Chadwick (Hon. Sec.), on behalf of Mr. Chapman, described these, and called attention to their extreme portability and the novel arrangement of swing-back and other important improvements. The cameras and shutter were much admired by all present.

After a vote of thanks to the gentlemen who had contributed to the interest of the proceedings, the meeting was adjourned.

Glasgow Photographic Association.

The first annual supper was held in the "Athol Arms" on Thursday, April 15, under the presidency of Mr. John Urie, with Mr. A. Robertson as croupier. There was a good attendance of professionals and amateurs, and with toasts, music, and conversation, a most agreeable evening was passed. The proceedings closed by drinking the Chairman's health with Highland honours.

Talk in the Studio.

South London Photographic Society.—The next meeting of this Society will take place on Thursday next, May 6th, at 8 p.m., in the rooms of the Society of Arts, Adelphi, when papers will be read by Mr. E. Cocking, "On the Pyramidal form of Composition in Pictorial Works," who will also give practical demonstrations on the black board; and by Mr. F. York, on "The Ferrous Oxalate Developer, with Results of Experiments."

Our versatile correspondent, Mr. George Bradforde, of Bath, sends us a selection of cabinet pictures, for the most part bust portraits, bright, vigorous, and well modelled. The lighting not only proclaims the well-trained photographer, but the art-student as well. A genre picture Mr. Bradforde also sends, is something more than a portrait; a roguish little scamp of some three or four years has wandered upon forbidden ground, and wickedly thrown down the board enjoining "trespassers beware." The satisfaction of the tiny lad as he sits there after this flagrant outrage is very apparent in his laughing face.

Suicide of a Photographer with Cyanide of Potassium.—An extraordinary suicide took place on the 1st ult. at Fitzroy (Australia). W. H. Brace, a lad of fifteen, conceived a strong affection for a girl named Rosa Coote, three years younger than himself. They had a quarrel, during which she, doubtless in jest, told him to kill himself. Unfortunately, he took the remark seriously. He obtained some cyanide of potassium—which he could easily do, being employed in a photographer's establishment—swallowed it, and laid himself down opposite the girl's father's house, where he was found on Sunday night in a dying condition. He expired shortly afterwards. The following letter was attached to his wrist:—"February 29th, 1880.—My dear Rosa,—I will have by the time you get this letter faithfully obeyed your command by killing myself. You hated me, and I loved you.—I still remain yours, W. H. Brace."

Dagonet, in *The Referee*, says:—"I see that the early photo's of Gladstone are being looked up, and we are threatened with one of him as a child of three. This sort of thing adds a new terror to photography. Fancy what our heroes will come to in later days. Imagine, if photography had flourished in the olden times, and to-day we were asked to admire the Duke of Wellington in long clothes, or Nelson in his perambulator. Fancy Tommy Carlyle, aged one, naked on a velvet cushion, and described as 'Thomas Carlyle, the Chelsea Sage,' or Gladstone, aged two, in a little chemise, as 'Ginx's Baby,' and labelled in the shop windows, 'Early Portrait of the Premier.' I was photographed when I was four, in a short frock and drawers and long ringlets. Fancy, some day when I'm Laureate, how horrified I shall be to see this stuck up in the Burlington Arcade, and labelled, 'Dagonet.'"

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, "*Photographic News*" *Office*, 5, *Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed* "*Union Bank, Photographic News Account.*"

Enquirer.—Both the oxalate and the iron are reducing agents; together they work very vigorously. The acid is the restrainer. The density is controlled by the period you permit the plate to remain in the developing bath.

Studio.—We cannot offer advice as to your taking up photography. Gelatine plates will have no effect in altering the build of studios, although they will permit photography, no doubt, to be undertaken in ordinary rooms. From our "At Homes" it will be seen that few studios are built on cut-and-dried principles. No. 1. Oblong shape with ridge roof is a good form; one side should be lighted from the north if possible. No. 2. Papier mineral would be no doubt very suitable, but it should be removable. No. 3. No objection to a wood-lined iron studio; as to comparative cost, we must refer you to a builder. No. 4. We repeat, Messrs. W. and D. Downey's studio is all ground glass where transparent; as to extent in your own, you must form your own judgment. We will consider your suggestion, and thank you for it.

Inflammable.—A simple way to render fabric uninflammable is, by using borax in the starching. One teaspoonful of borax should be used to each pint of starch after water has been added.

Blot.—One of the best ways to remove ink stains from paper is to apply with a brush—

Chloride of tin	2 parts
Water	4 ,,

afterwards pass the paper through cold water; writing can of course be removed in the same way.

Nemo.—An oxy-hydrogen lamp would be the most suitable for you. You will find the formula for sensitizing and developing, in a practical paper of Dr. Van Monckhoven, which appeared in the *Photographic Journal* of Dec. 1869, and a few days afterwards in the News.

G. J.—*Bulletin de la Societe Francaise*, 20, Rue Louis-le-Grand, Paris.

A. B. J.—The ordinary protosulphate as used in the wet collodion process. We employ distilled water, but it should not be necessary. We cannot account for your non-success; put the iron into your developing cup first.

Dr. Schnauss.—Thank you for letter duly received.

Adolph Ott.—Your change of address noted. We shall always be glad to hear from you.

A Subscriber.—It is the lens, and not the camera, that has focal length. For 15 by 12 pictures your camera should be able to open out to 28 or 30 inches, but it all depends on the kind of lens you use. You must get to see a few cameras, they are constructed so differently. "Practical Portrait Photography" is a simple book, and can be obtained on application to our publishers.

E. J. Ellery.—We will make enquiries for you.

Helio.—You will find an article in another column on this very subject; the way the sun's rays are flashed a distance of fifty miles in a straight line, and made to speak, is there explained. The instrument is called a heliograph; hence your mistake.

W. L.—You may levigate the pumice-stone powder yourself. Powder the pumice-stone as fine as you can, and put an ounce of it into a quart vessel of water; stir well, and allow the liquid to remain for ten minutes, then pour off half of the water carefully, which contains the finer particles in suspension, into another vessel. You may either allow the fine particles to settle, or you may filter. These particles are what is termed levigated. It is a process often used by chemists for separating coarse particles from the fine.

Julius Cæsar.—If you tone with iridium and gold you will find your transparencies much improved; they will not have the "dirty look" you complain about. See "Answers to Correspondents" three or four weeks ago.

Brighton.—Dynamite is simply a siliceous earth impregnated with nitro-glycerine, which is made in a different manner to gun-cotton. To make nitro-glycerine, you mix ordinary glycerine with nitric acid, and let the mixture fall drop by drop, or in a thin stream, into water, when the nitro-glycerine separates. Chemists explain the change in this wise. The oxidizing action of the nitric acid removes three equivalents of hydrogen from the glycerine, and replaces them by equivalents of nitric peroxide. As it is rather difficult to employ an explosive in liquid form, a spongy earth is chosen to suck it up. The clay in the dynamite fulfils no other purpose than that of a sponge.

F. Morris.—So long as you do not mix the two solutions of oxalate and protosulphate of iron, they will keep for an indefinite time. As the material is very inexpensive, you can have no compunction in throwing away the liquid.

The Photographic News, May 7, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

COLLODION AS A GENERATOR OF ELECTRICITY—THE SENSITOMETER—THE DIAPHOTE—THE ROYAL ACADEMY.

Collodion as a Generator of Electricity.—In last week's Notes we mentioned that Professor Borlinetto, of Padua, employed cardboard coated with collodion in the construction of an electrophorus, and we also mentioned that the Warnerke film was even still more capable of electrical excitement. Our attention has been called to the fact that Professor Guthrie has some timo since utilized the mixture of collodion and india-rubber for this purpose, and also given it a wider scope. As regards electricity, it is very remarkable that if you rub glass with the sheet of india-rubber and collodion, negative electricity is excited, where, ordinarily speaking, positive electricity is generated. One of the applications the Professor has given to this collodio-caoutchouc is the formation of miniature balloons for experimental purposes. An ordinary glass flask is first coated inside with collodion by rolling the liquid round and round inside. When dried, a layer of india-rubber is given to the collodion in the same way, and then another layer of collodion, and so on, till four or five thicknesses of collodion are reached. When dried the film is easily detached by lifting it at the neck of the flask, and pouring between it and the glass a little acidulated water. The balloon then comes out perfectly well shaped, and ready to be filled with any gas which it may be desired to try, and the neck is well secured by waxed silk or any other suitable means. In experimental physics there seem to be many useful applications of this medium, and no doubt it will come into use. One use we have made of it is to tie down the stoppers of bottles; and here its pliability is of great service, as there is none of that disagreeableness in opening a stoppered bottle which has been tied down with ordinary bladder. Photographers have before now brought into prominence some properties of different materials whose value had not been previously recognised. What would the German army, for instance, have done without the gelatine films made insoluble by exposure to light in presence of bichromate of potash? Their everlasting sausages would have had a hard timo of it.

The Sensitometer.—At a recent meeting of the Photographic Club—whose proceedings, by-the-bye, are not reported, and rightly so—Mr. Warnerke brought forward an instrument or piece of apparatus which he calls the sensitometer. Its object is to compare the relative sensitiveness of plates, and it consists essentially of different thicknesses of gelatine impregnated by lampblack placed in little squares on a glass plate. It is a most ingenious adaptation of an old principle to a new purpose. On each of the spaces is printed a number corresponding with the thickness of the gelatine. The two plates are exposed simultaneously to gas or daylight behind a pair of the sensitometers for any suitable time, and on development the last readable number which appears is taken as an index of sensitiveness. Thus, suppose 8 and 10 are the two numbers, the first plate would be only, say, one-third of the rapidity of the latter. We are not sure whether a scale has been made, and the numbers given above are only what may be called examples of guesswork. This is an instrument which no employer of gelatine plates should be without, and may be used as a photometer as well. For instance, in a studio a piece of sensitized paper may be exposed in a fixed place behind for a fixed time, say half an hour, and the number reached will be an indication of the exposure required; or a dry plate might be similarly exposed and developed, and the number read would answer the same purpose, always provided that the plates employed were of the same make. This, however, need not be a drawback, as any two batches of plates can be compared by the same instrument, as already indicated. Warnerke's photometer, or actinometer, whatever it may be called, which is dependent on phosphorescence, will, however, enable the photographer to be independent of this more elaborate arrangement. It would be a boon to the photographic world if Mr. Warnerke would enable it to procure this simple piece of apparatus. We might suggest that a standard scale and a standard light should be universally adopted to enable plate makers to at once compare the rapidity of their own plates with those of others by a simple reference to a table.

The Diaphote.—Last week we adverted to this instrument, whose object may be popularly said to photograph by electricity. Messrs. Ayrton and Perry, who might be called the Japanese twins of science, gave their idea of the matter, basing their hopes on the selenium experiments carried on by Professor Adams some two years back. The notion is a very natural one, and has been brought forward to our own knowledge at least three times, and how many more we should be sorry to say. France, that country of theoretical more than practical invention, was, we believe, the first country in the field, and the "notions" coming from there cover a very wide field indeed. In the *Globe*, too, the other night, we read that a Professor Minchin has developed photographic action at a distance, by means of electricity; so did Becquerel many years ago, and it is nothing new. Baines's recording telegraph is really the same thing. We have no doubt that an accurate copy of a picture in gelatine could be copied on the same principle that the telephone is worked. The greater distance of a needle or pointer passing over the image from a metallic plate beneath it, at one end of a wire, would excite a less quantity of electricity at the other, and a consequent less decomposition by the current of some readily acted upon compound. This would give true gradation, and might be utilized, but will probably be more of a scientific curiosity than of any great practical utility. The ardent Amaranthus in New York or Calcutta will still have to wait awhile before Araminta can send her portrait by telegraph.

The Royal Academy.—The private view of the Royal Academy is over, and the public can now criticise for themselves. In our opinion the exhibition is more than ordinarily good, and the subjects more interesting than last year. There are many new names in the list of exhibitors, and some whose works have been accepted, without having failed in previous years to gain admittance. It has struck us, what a pity it is that some of the beautiful pictures which hang upon the walls cannot be popularised by means of photography. For a few months a good picture can be seen by the public, and is then, so to speak, imprisoned in the mansion of some one who in all probability is a lover of art, rather than a lover of his fellow-creatures' enjoyment, and to the large majority of those who may have lingered over its beauties the remembrance of it fades into a misty kind of affair in the brain. Now a photograph would recall vividly to mind the subject, and its special treatment by the artist, and in these days of bromide plates the representation would be fairly accurate, since the yellows would not be represented entirely by a hideous black. A series of photographs published by some enterprising publisher would no doubt find a ready market amongst lovers of art, and it might be possible to induce the artists to allow such an undertaking to become a possibility. We believe we are right in saying that nearly every artist has a photograph taken of his pictures for himself, but, unfortunately, we are equally aware that the persons who undertake this private work are often incapable of doing full justice to the pictorial effect, since they are frequently chosen more "on the cheap," than for real knowledge of the "finesse" of the work that is expected of them. The natural result is an abuse of photography by artists in general, though we could mention names on whom praise is lavished instead; but this is only the caso when some well-known man has been selected for the post of photographer. Mr. Blackburn's Royal Academy Guide is now a recognised institution. How superior it would be if the etching were replaced by well-executed prints in woodburytype or collotype.

At Home.

MESSRS. HILLS & SAUNDERS AT PORCHESTER TERRACE.

Some years ago, when cabinet pictures were more of a novelty than they are now, a practised amateur of our acquaintance used to exhibit on his mantelpiece two well-finished prints which he considered representative photographs of English and French portraiture. The one was bright, clear, and well modelled, a cabinet portrait from Reutlinger's studio on the Boulevard Montmatre; it represented one of the actresses of the *Palais Royal*, and although, no doubt, a good deal of retouching had been done to the negative. the picture was full of *esprit* and "go," and altogether a delightful result to look upon. The British portrait did not pretend to such vivid clearness; it was more sketchy than vigorous, and was soft and delicate to a degree. It was that of a lady in a deer-stalker's hat, with fair curls, the features rounded, and the hair as soft as silk—a happy portrait of the late Miss Amy Sheridan, and the work of Messrs. Hills and Saunders.

Messrs. Hills and Saunders have always taken high rank in London, and last year were so fortunate, it will be remembered, as to secure a medal from the Photographic Society for a very fine enlargement on opal. They may be found "at home" at other places besides Bayswater, at Eton, Aldershot, Sandhurst, Oxford, and Cambridge; but the studio in Porchester Terrace is, we believe, the head-quarters. We have said studio, but the word is something of a misnomer. Any casual passer-by would fail to recognise the exterior as that of an eminent firm of photographers, and when the visitor has rung the bell and been ushered into the drawing room, the fact is no more apparent. There are a good many photographs on the walls, and several albums on the table, but scarcely more than you would find in the reception room of a private gentleman. If Messrs. Hills and Saunders will excuse the remark, there seemed to us an amateur-business like aspect about the place, which certainly had this effect, that it set the visitor at his ease, and did away with all formality and nervousness.

The enlargements to be seen were none of them on a very large scale, but all exhibited a soft pearlike tone that was difficult to understand at the first moment. They were one and all pictures upon porcelain, or rather pot-metal. Some were by the carbon process, the medal picture to which we have just alluded being one of these; but the majority had been secured by the aid of the powder process. Finely-grained opal glass was the basis in all cases, the ground surface permitting the artist to touch with stump or brush without previous varnishing. The carbon process employed was that, generally speaking, described by Mr. J. R. Sawyer in the News, a few weeks ago, while the powder process practised by Messrs. Hills and Saunders does not differ in the main from that detailed by Mr. Valentine Blanchard in our Year-Book. But there is this particular precaution to be taken, Mr. Cowan tells us—whom by the way, by a breach of good manners, we have failed hitherto to introduce to our readers—namely, that hand-ground opal is chosen. A cheap form of grinding has lately been introduced, by directing a blast of fine sand against the opal surface, which, however well it may answer for other purposes, is not suitable for the preparation of a glass surface that is to serve for photographic work of this kind. The sand particles are not equal in their action, and the consequence is that the surface is pitted here and there. It requires no magnifier to show these minute cavities, which can be well seen on closely examining a glass surface held horizontally towards the light, and pigment lodged in these cavities is very apt to leave the glass surface subsequently; a hand-ground plate, on the contrary, has a matt milky appearance, with a surface perfectly free from such imperfections.

The cabinet portrait is the favourite *format* still at Porchester Terrace, and Mr. Cowan, in turning over the leaves of a large album, showed how the backgrounds in every case were different. "Oh, I know where you had that taken; that's So-and-so's background!" is a remark not unfrequently heard; but at Bayswater, by the simple arrangement of a few ferns, dried palms, grasses, and rustic fencework, no two pictures are ever alike. Moreover, if it is a question of enlargement afterwards, these grasses, &c., help to avoid a lot of retouching.

Leaving the drawing room by folding doors, you pass through an ante-room into what was evidently a conservatory once upon a time, but is now a well-lighted glass room of wonderful capacity. Here again the visitor feels at his ease; there is no trudging up a flight of stairs and getting hot and flurried in the process; you might pass into the studio without knowing it, if it was not for a curious sort of camera that stands in the path, and never takes his glassy eye off you. "We'll tell of you, my fine fellow," was the idea that occurred to us, and we shall now do so.

This camera lives alone by itself. Mr. Cowan told us in confidence, and we repeat the secret under the same reserve, that there was no other camera in the studio. This is not, we believe, because Messrs. Hills and Saunders' means are insufficient to provide a second instrument, so much as that the one now in possession of the floor of the studio has no rival. We ourselves observed him work his optic more than once, without any visual agency, just to intimate what he could do when he tried; while his ability to secure a carte or cabinet or a ten-inch plate is only equalled by the readiness with which the base-board can be elongated and his body converted into a copying camera, when he goes on reproducing *clichés* without making the least difficulty about it. Despite its solidity, this occupant of the glass room turned with considerable ease; near its foot were two cells of an electric battery which supply its vitality, and cause either a drop shutter to fall, or a cap to be lifted, in obedience to its master's wish. The latter, provided with electric wires, may, as in the case of the Cadett shutter, move to some distance from the camera, and approach and talk to the sitter while he exposes his plate. To describe intelligibly the clever electrical arrangement which Mr. Cowan has ingeniously brought to bear would be impossible, nor would it serve any useful purpose, since to use such an instrument a man must be something of an electrician, and if he is this, he would probably do best to contrive a plan of his own. The making and breaking of contact, and magnetising and demagnetising of a piece of iron, is of course the principle upon which the actions rest; most people know that if you twist wire round a bit of soft iron, this soft iron will become a magnet any time that an electric current passes through the wire. The electric current, in encircling the iron, magnetises it; break the current, and on the instant the iron loses its magnetic virtue. Mr. Cowan simply makes use of electro-magnetism, or magnetism evolved from electricity, to work his camera.

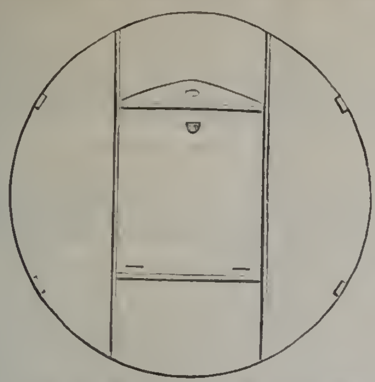
His cabinet and carte plates are made interchangeable in a simple way. The back of the camera is a flat circular disk which revolves; it is, in fact, very similar to a turn-table on a railway, only it is perpendicular instead of being horizontal. There are a pair of rails, or grooves rather, running across the turntable, and into these grooves is slipped the dark slide. If a cabinet is wanted the plate stands on end (fig. 1).

If cartes are desired, the table is turned, and the dark slide stands ready for securing three cartes (fig. 2).

The glass room may be said to be two rooms joined at right angles, and so favourably situated in respect to a north aspect that it is frequently possible to work without blinds at all. A blue banner screen, some two feet square, stretched stiff and borne upon a pedestal, so that it may be suitably adjusted over the head of the sitter, is in some cases the only shade employed in the studio. Mr. Cowan has no great faith in Seavey's backgrounds; his own, he tells us, are for the most part painted for five shillings a-piece, by an old hand who has been a scene-painter in his day. Rather than the conventional drab-grey usually affected in

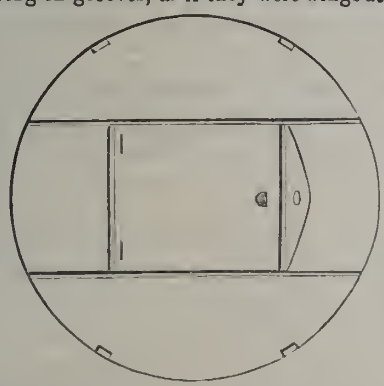
backgrounds, a warm brown or brownish grey is the tint preferred. The backgrounds are of various kinds; there is

Fig. 1.



one with ollers top and bottom, an endless panorama; others moving in grooves, as if they were wings at a theatre;

Fig. 2.



and a third description that is hinged, and acts like a practical door.

We were shown the properties wherewith all the rustic changes to be seen in Messrs. Hills and Saunders' cabinet pictures are carried out. Hay, dried grasses, dead palm leaves, together with a few growing plants in pots, and some branches and twigs, comprised the whole. "Wo throw nothing away," said our host, taking up a brown palm leaf from the floor; "we only take care to change the arrangement with every picture."

We have scarcely time to speak of the laboratory and dark rooms. Gelatine plates are in constant requisition at Porchester Terrace, but so are wet plates. The ordinary dipping bath is not to be seen at all here; the sensitizing baths are of a horizontal character, swinging on pivots, of the same nature as those we described at the Autotype Company's works. The interior is of paraffined wood, aud they possess the advantage that less silver solution is needed, while the plates are permitted to drain more effectually.

"One guinea for the sitting, which must in all cases be paid at the time," is a notice we extract from the card of Messrs. Hills aud Saunders, and for this guiuea the sitter may take his choice of twelvo cartes-de-visite, twelve vignettes, twelves medallions, six cabinets, or four boudoir pictures. Proofs are generally sent out the same eveniug, but always in au untoued and unmounted conditiou.

The next "At Home" will be "The Kew Observatory."

THE EYE AS AN AUTOMATIC PHOTOMETER.

AT the last meeting of the Physical Society a paper was read by Mr. William Ackroyd on the human eye as an automatic photometer. According to Mr. Ackroyd's experiments the eye itself is a fairly good light measurer.

When a "spot" or star of light is looked at from a distance, it is socn to emit "rays" or spokes of light at all angles. These are due to the radiato structuro of the crystallino lens and to the lachrymal fluid on the surfaco of the corner of the cye. The rays are of various lengths, and are shorter in the 1st and 2ud quadrants, next the nose, near the blind spots, than on the 3rd and 4th quadrants—a fact probably due to the insensibility of this region. The iris expands and contracts under tho stimulus of light independently of the will; aud both irises act sympathetically. Now the iris lies betweon the seats of irregular refraction, and thus any chango in tho sizo of the pupillary aperture will be rendored evident by an alteration in the length of the longer rays of a spot or point of light. On this fact is based tho use of the eye as an automatic photometer. Tho sensitiveness of tho iris varies in different persons. Mr. Ackroyd found that a sperm candle, burning 120 grains per hour, produced a distinct movement of his iris when 14 yards distant. In employing tho eye as a photometer, he adopted tho principlo that if tho light from ouo source A falling on the cye is capable of producing movement of tho iris at a distance *d*, and the light from a different source B is capable of producing the same movement at the distauce *d*, then the relativo intensity is proportional to tho squares of these distances. To carry this out iu practice the observer is in the dark, and an artificial star is placed ou a level with tbo eyes at a fixed distance. Below this is placed tho light to be tested in tho same plane. While gazing steadily at the star the other light is to ho eclipsed and revealed, and the observor is to find a position whero tho revealing of the second light does not influence his iris, as shown by no apparent shortening of the rays of tho star taking place. Ho then approaches gradually till a second position is reached, when the revealing of tho second light *does* produce a movement of the iris. Tho distanco between his eye and tho light *d* is measured. A third light is now put in place of tho second, and the same observations ropeated, so as to get a second distance *d*. From these distances the relativo intensities are calculated. Owing to the sympathy between the two irises these experiments wero binocular. This sympathy may provo convenient in construetiug an eye-photometer, sinco ono eye can be turned to the light to be estimated whilo tho other is looking at tho artificial star. This method of photometry would bo too dolicato for comparing powerful electric lights, unless aided by mechanical means.

SEEING BY ELECTRICITY.

BY JOHN PERRY AND W. E. AYRTON.

WE hear that a sealed account of an invention for seeing by telegraphy has been deposited by the inventor of the telephone. Whilst we are still quite in ignorance of the nature of this invention, it may be well to intimate that complete means for seeing by telegraphy have been known for some time by scientific men. The following plan has often been discussed by us with our friends, and, no doubt, has suggested itself to others acquainted with the physical discoveries of the last four years. It has not been carried out because of its elaborate nature, and on account of its expensive character, nor should wo recommend its being carried out in this form. But if the new American inventiou, to which reference has been made, should turn out to be some plan of this kind, then this letter may do good in preventing monopoly in an invention which really is the joint property of Willoughby Smith, Sabiue, and other scientific meu, rather than of a particular man who has had sufficient mouey and leisure to carry out the idea. The plan, which was suggested to us some three years ago, moro immediately by a picture in *Punch*, aud governed by Willoughby Smith's experiments, was this:—Our transmitter at A consisted of a large surface made up of very small separate squares of selenium. One end of each piece was connected by an insulated wire with the distant place, B, and the other end of each piece connected with the ground, in accordance with the plan commonly employed with telegraph instruments. The object whose image was to be sent by telegraph was illuminated very strongly, and, by means of a lens, a very large image thrown on the surface of the transmitter. Now it is well known that if each little piece of selenium forms part of a circuit in which there is a

constant electromotive force, say of a Voltaic battery, the current passing through each piece will depend on its illumination. Hence the strength of electric current in each telegraph line would depend on the illumination of its extremity. Our receiver at the distant place, B, was, in our original plan, a collection of magnetic needles, the position of each of which (as in the ordinary needle telegraph) was controlled by the electric current passing through the particular telegraph wire with which it was connected. Each magnet, by its movement, closed or opened an aperture through which light passed to illuminate the back of a small square of frosted glass. There were, of course, as many of these illuminated squares at B as of selenium squares at A, and it is quite evident that since the illumination of each square depends on the strength of the current in its circuit, and this current depends on the illumination of the selenium at the other end of the wire, the image of a distant object would in this way be transmitted as a mosaic by electricity.

A more promising arrangement, suggested by Prof. Kerr's experiments, consisted in having each little square at B made of silvered soft iron, and forming the end of the core round which the corresponding current passed. The surface formed by these squares at B was to be illuminated by a great beam of light polarised by reflection from glass, and received again by an analyser. It is evident that, since the intensity of the analysed light depends on the rotation of the plane of polarisation by each little square of iron, and since this depends on the strength of the current, and that again on the illumination of the selenium, we have another method of receiving at B the illumination of the little square at A. It is probable that Prof. Graham Bell's description may relate to some plan of a much simpler kind than either of ours; but in any case it is well to show that the discovery of the light effect on selenium carries with it the principle of a plan for seeing by electricity.—*Nature.*

PRINCIPLES OF OPTICS INVOLVED IN LANTERN CONSTRUCTION; AND ON A NEW ENLARGING LENS, ESPECIALLY DESIGNED FOR USE WITH THE MAGIC LANTERN.

BY J. H. DALLMEYER, F.R.A.S., ETC.*

IN my new lens I have endeavoured to carry out the following essentials of a perfect lantern objective, viz., sufficient aperture or diameter of the back combination (in reality, the front of a lantern lens), approximately equal definition at the centre and margins of the picture, freedom from distortion, and perfect achromatism. It is represented by Fig. IV. in position. In general outline it resembles my well-known patent portrait lens. Combination O—the one next the slide—consists of a convexo-concave of flint, and a convexo-concave of crown glass, the lenses being separated by a short interval. Their adjacent surfaces are of unequal radii, and externally the combination is a meniscus. It is of sufficiently large diameter to admit the entire converging cone of light, transmitted through the slide by the condenser. Among the forms of lenses devised for the purpose

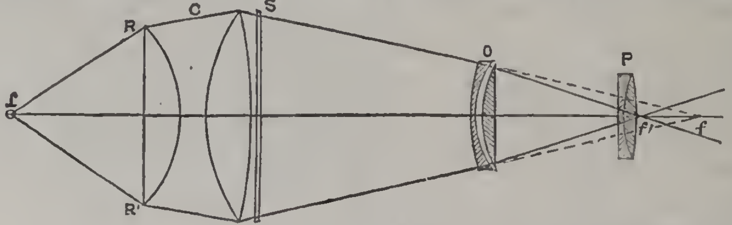


Fig. 4.

(and I have constructed several), I find this to possess the greatest number of advantages. Considered as part of the condensing system, it affords the means of correcting to a greater degree the positive aberrations, both spherical and chromatic, inherent in the condenser. The focus of the latter, after emergence from O, converges to the point *f*, that is, very nearly the position of the front combination P. This is a cemented compound externally of the meniscus form; its focal length and radii of curvatures are so apportioned that, at a position of one diameter from O, it completes the correction of aberrations, and the rays diverging from it form a non-distorted, well-defined image upon a flat screen. Combination P, as is apparent from the sketch, might have been made smaller in diameter; I have left it larger to ensure facilities for accurate workmanship. Also, should the radiant occupy a position slightly eccentrical with reference to its axis, the corresponding focus altering in position, then a larger diameter to transmit the entire pencil of light intact is required. As already stated, both combinations are achromatised for the visual ray, and by this means any colours that are in the slide are faithfully reproduced upon the screen—in other words, these lenses are intended for the lantern only, and not for photography, neither for the camera in the studio, the field, nor for enlarging purposes; the chemical and visual foci not being coincident.

At the present time I have constructed two of these lenses, viz., No. 1 of 1¾ inch diameter, the larger combination, intended for use with 3½ inch condensers of about 2½ inch equivalent focus, sufficiently large for a 3 inch circular slide. The other, No. 2, of 2 inch diameter and 6 inch equivalent focus, suitable for 4 inch condensers, or for 2¾ inch square slides. For the proper distance of screen, or size of enlargement, it is only necessary to divide the latter by the dimensions of the slide, and to multiply the quotient by the equivalent focal length of one or other of the lenses, plus one focal length. Thus to obtain an enlargement of 12 feet diameter from a 3 inch circular slide we require a distance of about 20½ feet for No. 1, and 21½ feet for No. 2 lens.

Obviously No. 2 lens is equally suitable for the smaller sized condenser, but it requires a greater distance of screen, and consequently does not give the same amount of light; a disadvantage to be set off against the probability of non-transmission of all the light from the condenser with No. 1 lens. Hence, in case of doubt, No. 2 lens is to be preferred. It is hardly necessary for me to state that each objective or lantern-lens must be used *intact*, and that good results are impossible with either one or other of the combinations used separately. That is to say, each objective affords but *one* focal length, and any increase or diminution in the size of the enlargement required must be obtained by an increase of distance or the converse, between the lantern and the screen.

One remark about the proper position of the radiant from the condenser. The lime spot not being a point, but of considerably larger dimensions, the *proper* distance will at once be apparent on inspection of the edges of the disc, which appear yellow and ill-defined when the lime spot is too far off, and become white and sharp as that distance is diminished.

As it regards the *mounting*, in a properly constructed lantern, the radiant, the condenser, and the objective should have one and the *same axis*.

Thus much for description. I regret that I am unable to show you the new lenses in operation, since the covenants of the lease under which the Society holds this Gallery prohibit all lantern exhibitions. In the absence of this I must content myself with reporting the experience of the reverend gentleman already referred to, who has used the instruments described for upwards of a twelvemonth. He writes thus:—"I can imagine nothing better! With your condenser I get both light and sharpness; with your lens the picture appears as if received on a flat surface well defined throughout. My object in exciting you to turn your attention to the optics of the lantern was to improve it and make it more useful to the public lecturer, and this we have undoubtedly accomplished."

* Continued from page 211.

ON DEFECTS IN THE GELATINO-BROMIDE PROCESS.

BY DR. J. M. EDER.*

g. HARD, glassy, over-intense negatives are produced when the development is slow and lengthy—when the high lights have made their appearance, and continually increase in density long before the half-tones come out. This is generally due to under-exposure, but it is also often caused by too large a proportion of potassium bromide, either in the pyrogallic, or else in the iron developer. In the first case, the bromide should be reduced in quantity; in the second, it may be omitted altogether, and the action can be moderated by diluting with water. The defect itself is seldom observed when the alkaline pyrogallic developer is used, oftener in the case of under-exposed plates developed with ferrous oxalate. When the same solution has been employed for developing a great number of negatives, it may be found that the negatives are harder than when it was quite fresh. It requires practice to know when to break off developing, and to make it agree with the exposure. Over-intense negatives, in which all the details have been brought out, but which are too dense (owing, for instance, to prolonged development after the normal exposure), may be, perhaps, cleared by treating with dilute (1 : 80) hydrochloric acid, or with a very weak solution of chloride of iron, or with one of potassium cyanide; but this treatment runs the risk of destroying all the fine details. In judging the quality of negatives, we are liable to be mistaken; negatives developed with pyrogallic acid often copy hard, though they do not look like it, because the yellow colour is very non-actinic.

h. Bubbles and wrinkles in the film, as well as its tendency to spring off from the glass, are generally the consequence of an inferior gelatine (see §1 *a*); but the fault first makes its appearance during development. It is generally observed when the developer contains too much alkali—that is, of course, in the case of the pyrogallic developer—but is scarcely ever seen when ferrous oxalate is used: the latter has, in the strict sense of the word, a tanning and hardening action on the gelatine; it therefore prevents the formation of bubbles, and renders any other hardening unnecessary (see §1 *b*). After tanning with alum, the plates will even bear treatment with acids and alkalies without the layer of gelatine suffering any injury.

i. White prints or round spots with a sharp outline, which, after fixing, have a glassy polished appearance, are caused by air-bubbles adhering to the plate, and preventing the developer from penetrating. These bubbles may be avoided by rinsing the plates with water before development, or by a gentle movement of the pan during the same. They can also be removed by a camel's-hair brush at the same time.

k. The ferrous oxalate developer soon grows turbid after being mixed, and deposits a yellow powder, which, in settling on the plate, causes fog. This is simply owing to the fact that in mixing the sulphate of iron with the oxalate of potassium, the latter was not used in sufficient excess, or, in other words, that too much sulphate of iron was taken. Turbidity may also be produced by the addition of too much acid to the solutions, but is seldom caused by the impurity of the ingredients.

l. If the gelatine plates have been kept for a long time in a dry place, they will take the developer with difficulty and unequally, and this causes spots. The remedy is to soften the plates in water before developing.

m. Irregular, denticulated lines and spots make their appearance when there is too little developing solution flowed over the plate, so that portions only are covered. In this case also, if the plate be previously moistened with water, a less quantity of developer will be required.

6. *Defects caused by Haloes.*—These surround the high lights; they are almost always due to the plate being too thinly coated with emulsion, and disappear altogether directly the films are perfectly opaque. Haloes are generally more liable to appear when the emulsions have a small quantity of bromide in proportion to the gelatine.

7. *Defects arising during Fixing.*—*a.* The negatives get fogged or spotted when light is admitted before the fixing is complete. This fault is, however, seldom observed when, previously to fixing, the developer is well washed away, even if weak daylight be admitted during the fixing.

b. Bubbles and wrinkles in the film can be avoided by tanning with alum, as was described among the defects during development. This defect is most often seen when a very strong fixing soda is used.

c. If the ferrous oxalate developer have not been sufficiently rinsed out, the fixing soda turns yellow, and communicates the same colour to the negative. As a remedy may be recommended thorough washing before fixing, or the yellow colour can be often got rid of by mean of fresh fixing soda.

8. *Faults Arising during Cleaning or Weakening e Negative.*—Hydrochloric acid has a tendency to wrinkle up the film, if the precaution has not been taken to dry the plate beforehand, or to tan the film with alum. Iron chloride has the disadvantage of colouring the whole film yellow. In attempting to weaken the negative with cyanide of potassium, the details will be eaten away, if the solution be too strong—stronger than 1 : 50.

9. *Defects of Intensification.*—*a.* Red fog often appears when the plate is intensified with silver, more especially when every trace of fixing soda has not been removed. It will be best cured by a short bath in a weak, sherry-yellow aqueous solution of iodine in potassium iodide. When this remedy is adopted there is not much to fear from intensifying with silver. In general, the pyro silver intensifier for gelatine plates is less certain than the ferro-silver intensifier, especially when the latter contains sufficient acetic acid and a small quantity of gelatine solution.

b. Intensifying also with mercury, uranium, and other substances gives a brown or yellow veil, if the plates are not properly washed after fixing. An exception is offered in the case of Edwards' method, in which the plates must be well rinsed, but need not be streamed or washed to excess.

c. Intensification that has been too long continued produces fog in nearly every case, and with any method; this is especially liable to occur in intensifying with silver. When mercury is used, the process must be carefully watched, as, if the action is allowed to continue too long, the negative becomes much too dense. This is also the case in the method of Mr. Edwards.

d. After the film has been intensified, it is liable to alter still further, either in the direction of darkening or of fading. Both of these defects are likely to occur when the mercurial intensifier is used; for example, after the film has been intensified with chloride of mercury, and then flowed over with ammonia, it will grow paler, but with the double iodide of potassium and mercury it becomes darker, and sometimes the whole surface turns of a brownish-yellow colour. Edwards' method gives a tolerably permanent intensity, though some operators will have observed a change of colour in negatives intensified in this way. The silver intensifier causes sometimes over the plates a red brown veil, which appears in copying, and arises from the solution of silver not being completely washed out of the gelatine. It is consequently advisable, after the intensifying with silver is finished, to fix the image once more, in order to get rid of the last trace of silver that has penetrated into the film. By this means all liability to subsequent alteration is avoided.

Besides the defects above pointed out, there are many others, which, in a great degree, depend on the quality—or, rather, on the faulty composition—of the different intensifying liquids. These could only be thoroughly described by means of an exhaustive account of every one of the different methods of intensification.

* Concluded from page 202.

The Photographic News.

Vol. XXIV. No. 1131.—MAY 7, 1880.

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COLOURED PHOTOGRAPHS.

A LITTLE while ago we explained in these columns the plan adopted to secure "photographs in colour" which an ingenious photographer has brought to this country, and, we believe, patented. Several illustrated journals, among them the *Theatre,* are said to be contemplating the application of this process, and from a contemporary we hear that the method is shortly to be worked on a large scale. Like the hundred-and-one other processes of producing photographs in colour, this fails at once on criticism by any intelligent photographer, and we have no need to assure our readers that the invention does not involve any scientific law or reaction with which they are not fully acquainted. That it is a clever plan of colouring photographs we do not deny, and some of the manipulations involved may even lay claim to novelty, but the principle is so old, and has been made use of already so frequently, that we doubt if any patent could stand.

There is nothing of novelty in placing a photographic film over a surface of colour. Both the Woodbury film and the carbon film have been thus applied. If it were a coloured portrait that was wanted, the face, hands, and drapery were painted in vivid colours upon a sheet of paper, and then the photographic portrait superposed. The effect, even in the case of a rough daub, is not very bad; and, if some pains have been taken in the colouring, a really pleasing result may be secured. M. Léon Vidal, in some work he conducted of this nature, printed his photographic film over the colours from a collotype block, and thus made a sort of chromo-photo-printing process of it all. The colours were first of all applied to paper one after another by printing off in a lithographic press, as in ordinary chromo-lithography, and finally the coloured sheet received a fatty ink impression from a collotype plate.

In respect to the new process of which we have heard so much, there is little doubt that the effect is produced in the way we have already described. Plain salted paper is sensitized on the silver bath and lightly printed under a negative; this faint print is then coloured rather vividly with suitable aniline dyes, which are applied in the form of a wash, the more skill devoted to the work the better being the final result. These bright portraits are now floated upon albumen, in the same manner precisely as if you were preparing albumenised paper, and, when dry, sensitised on the silver bath a second time. The negative is placed over the picture exactly where it was before, and a second and more vigorous printing follows. The consequence is that a silver image is formed over the coloured one, the former supplying the shadows and softening down the glare of the pigments, in the same way as the Woodbury and carbon films have been made to do in their time.

The process is undoubtedly ingenious, if it is not new, and our readers, we believe, are shortly to have an opportunity of judging of the pictures in some of our illustrated periodicals. One improvement we would, however, suggest, viz., the substitution of other pigments for the aniline dye. Some of these are known to be very fleeting, and if the "photographs in colour" come to fade, the defect is likely to be ascribed to the photograph, and not to the colour.

TESTING THE SENSITIVENESS OF GELATINE PLATES.

THE commercial gelatine plate varies so much in sensitiveness that those who would rely upon it for everyday-work must necessarily have some ready means at hand of testing its qualities in this respect. Pouring the developer over a portrait plate taken in the studio is, no doubt, the best criterion of all, but you frequently spoil a picture in gaining your experience. Another plan is to make use of a simple photometer, and apply this to one or two of every fresh batch of plates that comes into the studio; you get to know then if the films are up to your standard degree of sensitiveness, and if they work without fogging.

Several photometers have lately been devised suitable for the purpose. Mr. Warnerke, the other day, exhibited one so finely graduated that its last degree represented 1,300 times that of the first. But a very simple instrument we have seen used in the laboratories of Mr. Bedford, Mr. Cowan, and others, appears to answer for practical purposes, and this we recommend to our readers. A sheet of glass, whole-plate, or other convenient size, is covered with tracing paper, or *papier mineral* (which is simply paper steeped in melted paraffin) in such a way that in one part there is one thickness of paper, in another two thicknesses, in another three thicknesses, and so on. It is best to divide the plate into squares, thus; and place a

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

figure in Indian ink to indicate the number of thicknesses of paper there are in that particular part of the plate. *Papier mineral* is better than tracing-paper, since it does not turn yellow.

This simple photometer is put into a printing-frame, and a gelatine plate placed upon it in the dark room. A light of known intensity, either gas or candle, is now permitted in the dark room, and the printing frame exposed for a certain time to its action. For instance, you may put the printing frame at a distance of six feet from the light, and permit it to remain there exactly sixty seconds. Then immerse in your usual developer for a stated interval—say also sixty seconds precisely—and examine the result. Probably a gelatine plate will satisfy you which shows the number 13 pretty plainly, and accepting this as your standard, you may then make comparison with other plates.

An Argand gas-burner makes a good light for testing purposes, but a more delicate one is afforded by the standard sperm candle, which is readily procurable from gas engineers and large candle manufacturers. The standard candle burns at the rate of one inch per hour, during which period it should, according to the Act of Parliament, consume 120 grains. It is not an infallible standard, it is true, but it is one of the best we have, and the photographer will find it of use.

This simple photometer is at best a rough one, but it answers for testing both plates and developers; only care must of course be taken to observe accuracy in time and distance.

Notes.

Professor Armstrong, F.R.S., commences a "tutorial and laboratory course" of photography next week at Cowper Street, Finsbury.

These lectures, as also a series in chemistry, are given under the authoiity of the City and Guilds of London Institute, of which we have heard so much lately. The fee for the course of photography is ten shillings.

Mr. Howard has sent us a rare little picture of Burnham Beeches. In the foreground is a placid sheet of water with silver birch trees gracing the margin, their slender stems in contrast with a stout old beech that grows hard by. The bright landscape tells clearly of the advent of spring, and is enough to set everybody longing for the summer-time, save and except, by the way, that fox-hunting squire of history, who, disgusted at his sport coming to an end, always kicked off his boots in an ill-humour at the first sight of green trees and sunshine, with the remark, "Here's the beastly summer again.

An important point Mr. Howard call attention to in this photograph. A little girl appears in the picture whose dress was red or crimson, and yet the gelatino-bromide plate has rendered the drapery with particular detail Here, then, is one advantage the more to be derived from the employment of these plates in portraiture aud landscape work. Of course the scientific fact has long been known that bromide of silver is particularly sensitive to the less refrangible colours of the spectrum.

Says a correspondent in the *Daily News*: "Science and art have done much to facilitate political intercourse; but there is one thing photographic art might do which would greatly facilitate parliamentary intercourse in the new House of Commons. If each new member brought with him two or three photographs bearing his name, and gave one to the chief doorkeepers and to Mr. Inspector Denning, it would be the means of establishing their identity, and ensuring their recognition in the early days of their attendance."

An arrangement of this kind was adopted at the Paris International Exhibition of 1867. Every holder of a periodical ticket, whether for a week or for the whole of the summer, was required to have his or her photographic portrait pasted upon the document to permit of identification.

On Tuesday, the Lord Justices of Appeal reversed the decision given by Vice-Chancellor Bacon, that the Berlin-wool pattern of Millais' "Hugenot," issued by the proprietor of *Bow Bells*, was an infringement of copyright within the meaning of the Act. Consequently, Mr. Dicks will not be called upon to pay the five thousand pounds damages awarded by the lower court.

Another method of making light transmit its action through the electric wire. If you take a plate sensitised with bromide or chloride of silver, and put it into a cell with a plate of metallic silver, and surround the two with a conducting liquid, as in an ordinary battery, you will find that electric action is set up as soon as a light is brought near the sensitised plate. Indeed, a current is set up in the dark between these two surfaces, but it becomes much stronger if you approach a powerful light A flaming match will make au appreciable effect. So that you have here an electric battery which works more or less vigorously according to the intensity of the light shining upon it. A wire from the battery leading away into another cell containing a second sensitive plate brings about decomposition of the latter, for on developing this second plate with pyrogallic acid, there is distinct evidence of the action of light. Thus we have light carried from one sensitive plate to another by means of electricity. This is Professor Michin's mode of transmitting light.

Most of us are aware that of late years a record has been made by the Astronomer-Royal of the number of hours' sunshine we are favoured with, but the way in which this record is kept is not so generally known. We see by the papers that we have enjoyed so many hours' sunshine in a week or a month, but then the Astronomer-Royal's idea of sunshine may be very different to our own. It is worth while noting, therefore, that with the officials at Greenwich and Kew, sunshine does not mean light sufficient to cast a shadow, but light sufficient to char paper with the aid of a lens.

If the sunshine is not sufficient to make the burning-glass act, it is not considered sunshine at all. The recording instrument is a very simple affair. There is a ball of glass, say three inches in diameter, and around this ball, not touching, but a little way off, is a band of paper. The glass ball acts as a lens, and the paper is in the focus of this lens, so that if there were sunshine all day, the sun would burn upou the paper a complete line. As the sun moves, or rather the earth, the burning spot travels along the paper. The paper is divided into sectious representing hours, and wherever a charred line is shown, we have proof that the sun was shining at that particular period.

The record, valuable as it may be in some respects, has obviously little photographic value. If the sun shines at very brief intervals, or the sunshine is a little hazy, there is no record of it. Again, however well suited the Observatory at Kew may be for makiug such records, that at Greenwich can hardly be depended upon. The thick smoke and vapour that come over in volumes from the Isle of Dogs often obscure the sun at the Royal Observatory, when it is apparent to the rest of London aud its suburbs.

The *Chemical News* tells us that M. E. Conche has recently forwarded to the French Academy of Sciences some photographs of the solar spectrum which "give the prolongation of the spectrum into the obscure symmetric region of the blue with reference to the extreme red."

We have been employing an "Aladdin lamp" for the development of gelatine plates, the lamp in question being simply a glass plate with a surface of luminous paint at the back. According to Mr. Baden Pritchard, it will be remembered, luminous paint, after it has absorbed light, will impress a gelatine film placed in contact with it for the space of a minute, while he has been enabled to secure an image of the phosphorescent material in the camera with an exposure of ten minutes. But the ordinary ruby light of the dark room is quite as active, as many of our readers have discovered by this time. The "Aladdin lamp," we have found, may be used fearlessly in the dark room, if the gelatine plate is at once immersed in the developer, and with a porcelain or white enamelled dish the lamp affords sufficient illumination.

The idea of employing a semi-transparent background in the form of a sheet of ground glass, in order to give increased relief to the figure of the sitter, in the clever manner adopted by Messrs. W. and D. Downey, at their new studio in Ebury Street, is not altogether novel. A similar arrangement was made use of by Adam-Salomon some years ago, when we visited his studio in Paris, the glass sheet in this case measuring some six or eight feet in width.

To-day Mr. Woodbury reads an important paper on the subject of his modified relief process before the French Photographic Society.

The Central Union of the Fine Arts applied to Manufactures at Paris will, on the 1st August next, open an Exhibition at the *Palais de l'Industrie.* Photography is to have a place in this exhibition among the exhibits of Class XIII., "Modern Publications relating to working in Metal." Full information concerning the details of the exhibition can be obtained at the office of the Central Union, 3, *Place des Vosges, Paris.*

M. Trutat, Keeper of the Natural History Museum at Toulouse, finds that collodio-bromide emulsion is much too slow for the particular kind of work he has to undertake. Especially during the dull cold days of last winter, the prolonged exposure that was necessary produced a light veil which spoiled completely the transparence of positive prints. To obviate this difficulty he tried the alkaline developer in a hot state, and obtained excellent results. In the positives taken by contact there was no veil at all, and for negatives the time required for exposure was reduced by one half.

Careless photographers who are in the habit of breaking their porcelain dishes will do well to remember that they have always the means at hand for cementing the utensils together again. Gelatine and acetic acid are to be found in every photographic laboratory, and by dissolving the former material in the latter, so as to form a thin paste, an excellent means for repairing porcelain and glass is secured.

Topics of the Day.

THE NITRATE BATH—HOW TO MAKE AND KEEP IT IN ORDER.

BY VALENTINE BLANCHARD.

In these days of progress, when gelatine has almost usurped the place of collodion, and the nitrate bath is threatened with utter annihilation, the title of this article will be read with surprise by many.

I am, however, assured by the Editor that a plain description of an easy and sure method of making and keeping in order the nitrate bath will be of use to a large number of the readers of this journal, and therefore, in answer to his request, I will endeavour to describe, as clearly as I possibly can, the plan I have adopted for the past twenty years in the preparation of the silver bath.

During the past few years there have been one or two secret processes advertised for securing enormous sensibility, but in England we have not heard of any very wonderful productions resulting therefrom, and it may be here interesting to state that a well-known amateur surprised a Parisian demonstrator of one of the processes in question, by beating him in a contest for sensibility; and, on being asked if his process could be obtained, replied that it was not a secret in England. It was the use of pure silver, pure water, simple iron developer, and the collodion of a well-known English maker, now equally famed for his dry plates.

It must be clearly understood at the outset, that this article is not offered as a guide-post for those who know the way, and that it is only to be looked at by those who do not wish to go floundering about bye-paths, but desire to arrive at their journey's end by a sure and safe road.

To begin, then. It must be remembered that in order to secure the greatest sensibility in the silver bath, pure nitrate of silver and pure water are all-important, the silver, however, being much more important than the water. If time be no object, any ordinary water may be employed. It must be remembered that silver is one of the most delicate tests for impurity in water, and if, therefore, any organic matter be present, give only time, and it must be precipitated. It is well to remember this, for while it is always better to employ distilled water when assured of its freedom from chemical contamination, it frequently happens that it would be a great convenience to be able to employ the ordinary water ready to hand. With distilled water the bath may be used at once, but if rain or river water be employed, it will be better to put the bath in sunshine for twenty-four hours before filtering. Take, for each ounce of nitrate of silver, 14 ounces of water (distilled when you can get it), and 5 grains of iodide of potassium, also 5 grains of carbonate of soda. Stir the solution with a glass rod. The silver will soon be dissolved, but a primrose deposit will be formed which will not dissolve even after repeated stirring. Put the solution, sediment and all, into a clean glass bottle, and place in a bright light for as long a time as possible—the longer the better. When wanted for use, filter. Put the solution in the bath, and try a plate. In all probability a tolerable picture will be attained, but it will be well to add a small portion of nitric acid. Make a weak solution for stock by taking 1 ounce of nitric acid and 8 ounces of water. Of this preparation take 4 drops. It will be better to wait until this is thoroughly mixed before trying the next plate—say half an hour. If this period of time should be regarded as eternity by the eager experimentalist, he may be permitted to put in a plate at once (after well stirring in the weak nitric acid, of course), but he must keep the plate in motion all the time until oily lines disappear, when it may be placed in the dark slide, and exposed in the ordinary way.

It will be found that with the collodion of any good maker, and an iron solution of (say) 1 ounce protosulphate, 1 ounce glacial acetic acid, per pint of water, a good rich negative will easily be obtained in a fair light, even with a very short exposure. Should, however, the negative not be all I have described, do not too readily blame the bath, but rather look for failure in over-exposure—light getting into the front of the lens instead of on the features of your sitter—too much light in your dark room—in fact, light somewhere where it is not wanted. If you cannot trace failure to any of these causes, put the bath into sunshine, and leave it for a day. But I must insist that if all the directions have been carefully followed, failure is all but impossible.

The bath, as described above, is in the most perfect state of sensitiveness, and if *each day's waste be regularly made up from stock solution*, the bath will go on for a long time without showing much loss of sensibility; but, of course, it extracts acid from each collodion plate dipped in it, particularly if the collodion be very yellow; and in time it absorbs a considerable quantity of ether and alcohol. If it be found difficult to make the developer flow, in consequence of greasiness, and the addition of alcohol becomes necessary in order to get over the difficulty, it is clearly time to take the bath in hand. Turn it out into a large glass bottle, add about half its bulk of water, and shake. It will be found very milky. Now add a small pinch of carbonate of soda, and shake again. Put into the sunlight, and leave for as long a time as possible—not less than forty-eight hours. Now filter. Afterwards boil down in an evaporating dish over a Bunsen's burner until brought down to the original quantity. Try strength with an argentometer. It should show about thirty-five grains per ounce. If an evaporating dish be not ready to hand, the bath may be put in a shallow dish and evaporated by sunlight until brought down to the right strength again. It should now be filtered, and a plate tried. Very weak acid may be added, as in the beginning, if necessary; but, as a rule, a fine creamy image will be given without the addition of acid.

By following all the directions given above, success must follow. I shall conclude by a few hints for general practice.

It is well to have enough bath solution to more than fill two baths. Work one of the baths a week, filling up from day to day, to make up for loss. At the end of the week turn out into stock bottle containing sediment of carbonate of silver, and place in sunshine. Do not use filtering paper, but place cotton-wool in the funnel, and do not mind the dirty appearance it assumes after a time. Besides the reduced organic matter collected in the funnel there is carbonate of silver, and in process of filtration any free nitric acid present will combine with it, forming nitrate of silver, and rendering the bath at the same time neutral. Keep stock solution in a bright light, and never pour all the sediment into the filter, for while carbonate of silver is present in the bottle the solution can never remain acid, and the organic matter formed by the ether and alcohol given off into the bath from the collodion is much more easily reduced by the light when the solution is neutral. Should pinholes at any time present themselves, add water, filter, and afterwards evaporate as described above. By the use of cotton-wool, instead of filtering paper, a great economy is effected; and if a large filter be employed the bath can be filtered at the end of each day without any loss of time, and clear and bright solution, in perfect order, will be ready for the commencement of each day's work; but, above all things, make up for the waste of the day from the stock solution, so that the bath is always kept full. A careful attention to above directions must ensure success.

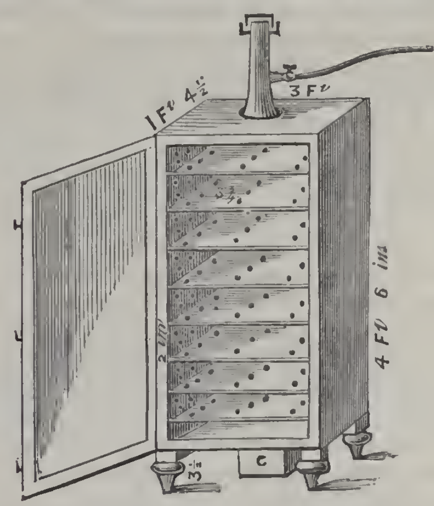
The "Topic" for next week will be "The New Power," by Mr. H. P. Robinson.

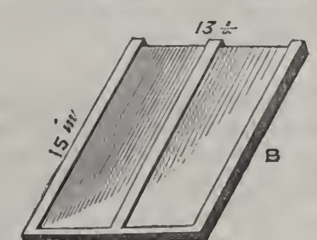
MY DRYING BOX.

BY W. BARRY.

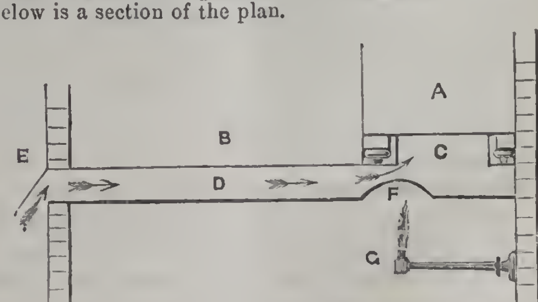
I have seen enquiries made for plans of drying boxes for gelatine plates, so I beg to submit mine for your inspection and the readers of the News, if you think it of sufficient merit to occupy your space.

It has an inner and outer casing, the former being perforated, also the shelves as shown; the inner casing projects to the front half-an-inch, so that when the door is closed it fits into the frame of the door, and so prevents ingress of light. A is a tin chimney with an argand burner





therein—of course there is no glass chimney to the burner. B is a shelf of wool with three laths nailed thereon, on which the plates, $6\frac{1}{2}$ by $4\frac{3}{4}$, are laid flat. Each shelf holds six plates in two rows of three, and each shelf of the cupboard or box holds two of the movable shelves. There are really eleven fixed shelves in the box, but I have not drawn them all, so that I can dry eleven dozen plates at one time. There are two round battens fixed under each shelf to prevent friction and raising dust in sliding them in and out. C is a box which connects the cupboard with the air channel under the floor, the arrangement of which I think is original, and will attempt to describe. Below is a section of the plan.



A, is the cupboard in the dark room; B C, is the box which connects the cupboard with the floor, also shown in the front view. D is a tunnel formed by the two joists of

the floor. The floor itself and the ceiling of the room below it, communicate with the open air E, two bricks being removed out of the wall. F is a tin dome, isolated from all ceiling laths and wood work. G is a bunsen burner fixed in the room below at the end of an ordinary gas bracket. The passage of air is indicated by the arrows; it impinges on the hot tin dome, which takes all chill and damp off it, and then rushes up into the drying-box through the perforated bottom and shelves, and also is drawn up by the heated air in the top chimney. The consumption of gas is only small, as neither light need be turned up beyond a small blue flame. I fill the cupboard above the door for twelve hours, and every plate is then dry; of course, those on the bottom shelf dry first in about four hours. I used to remove them, and bring others down, but found that the check given to the drying marked the plates. All this may appear very complicated, but I don't think it is so. Two bricks out of the wall, a hole in the floor, the tin dome in the ceiling, and the thing is done, as all the rest of the tunnel is ready to hand.

Correspondence.

CANARY MEDIUM *v.* RUBY GLASS.

Sir,—A communication to the West Riding Photographic Society by Mr. Bridges, which appears in your pages of April 30th, reads so conclusively in favour of the yellow light as a substitute for ruby glass, that we believe all makers and users of gelatine plates would hail the new medium as a great godsend, affording, as it does, an easy comfortable light, if it could only be guaranteed a reliable one, which—with all due deference to Mr. Bridges—we very gravely—nay, positively, doubt—from its behaviour in our hands.

Hearing of this new medium (a canary-coloured paper, of which we enclose you a sample) about a month ago, we obtained a sheet from the makers, and at once tested it by the spectroscope, under which it entirely failed; we next developed a portrait upon one of our extra rapid plates by a gas lamp covered with two thicknesses of the paper, the result being a general veiling of the negative; we then exposed one half of a plate, in a dark slide, for two minutes to the light of a candle covered with the canary paper, and developed in the usual manner under our usual ruby-orange light, when the exposed half yielded a density of impression equal to the flesh tints in a fully-exposed negative, whilst the shaded half remained perfectly clear. These three tests were so conclusive that we needed no further; and however sanguine we may have been as to the advent of a new light, we must say that we have not yet found one to replace the old one, which is sufficiently reliable for the development of a very rapid plate.

We know that an ordinary sensitive plate may be safely developed under a deep orange light, without the ruby; but for an extremely sensitive one (which is in general use) we may confidently say, from a series of exhaustive experiments we have made, that a combination of the ruby and orange tints properly diffused is the only one which will effectually intercept the complementary blue and green rays that are fatal to the perfect development of an extra rapid gelatine plate.

The simplest form of light (and one which we use in our own testing room) is obtained from a sheet of deep orange glass in the window, covered with a blind of Turkey red, when we have a properly diffused and ample amount of light for developing by; or, what is equally safe, a single piece of adiactinic silk, such as is used for dark tents, placed in an ordinary window, if free from direct sunlight, answers admirably.

An article on this subject, which we wrote for your last Year-Book, gives the results of several experiments with various forms of light; and we have since continued our investigations in this direction, but it would be too lengthy a matter for description in a letter; our sole object now is to caution workers of bromo-gelatine plates against discarding the use of ruby glass until something equally reliable has been found to take its place, and that "something" is certainly not canary medium.—We are, yours faithfully, D. H. Cussons & Co.

Southport, May 3rd, 1880.

PAYMENT OF ASSISTANTS.

Sir,—Your correspondents "Beau Nash" and "J. Kay" are ready pensmen; I wish they would as readily give some practical advice. How are we, or I should say am I, to learn photography properly. When I become competent I am told I can command a good salary—ten pounds a week, they say—but how can I become competent? Energy and hard work are very well in their way, but I contend that these alone do not make an able assistant. We want a good training in a good establishment. Now where can I get this? The old days of apprenticeship are gone, or, rather, apprenticeship never existed in photography; but do any of our first-class studios allow pupils? A young man would be glad to pay a modest premium if he could be taught well. As it is, all we get to know is how to clean a plate, coat and develop it, and do the printing. As for the chemistry of the process, that is never thought of for a moment. If you, sir, could tell us how competent assistants could be trained, it would be better than writing long letters about our defects. We know, or some of us do, that we have much to learn, and I can assure you there are many who are willing; but we want the opportunity.

For myself I think thirty shillings a week is very little pay if a man can take a clean plate, with the subject well lighted, which will print well. I think few handicraftsmen earn moderate wages like that. Carpenters and bricklayers and fitters would turn up their noses at such wages, and why should not—much as you dislike his name—

An Operator of Six Years' Standing?

Sir,—I can corroborate the letter from "Employer" in this week's News. To my knowledge there is one gentleman who has received ten pounds a week for a year past in one of the Baker Street studios, while another I know receives seven pounds. As to assistants who receive five pounds a week, I could mention half a dozen out of hand. Of course in all these cases the assistants are competent photographers—men *au fait* in every branch of the art; but at any rate it shows that good pay is given to good men.—Yours obediently, Another Employer.

A NEW STUDIO.

Sir,—I should be obliged if any of your numerous readers would give me any information. I intend to put up a small photographic gallery, and should be obliged for any hint in regard to its construction in respect to arrangements for light. I can get illumination from front, back, and skylight, but I am blocked up on each side. Any information in regard to the construction of the windows, &c., would be esteemed.—Your obedient servant, W. L.

FACES IN THE BIOSCOPE.

Sir,—The adaptations of the bioscope (described in your last issue) are numerous. It is by no means essential that the portraits placed in the bioscope should have been taken at the same sitting, as indicated in your paragraph, provided only and always that the portraits are those of the same person.

If the exact centres of the pupils of the eyes are adopted as "zero points," and the exact width from pupil to pupil

are carefully obtained, then their bioscopic arrangement is not difficult. Thus, for example, there exist portraits of Mr. Gladstone which offer exactly the same points of sight. One of these was taken just twenty-two years ago by Messrs. Maull and Glover; the other about two years since, by the Stereoscopic Company. Curiously enough, there is, in several respects, a rather remarkable dissimilitude between them; yet, when placed life-size together bioscopically, the result is very striking, and far more noteworthy and interesting than that of the winking portrait referred to in the paragraph, for Mr. Gladstone may there and then be seen in the very act of transformation from manhood to age —or say, rather, from age to youth—just like another Faust transformed by another Mephistophiles.

More marvellous and unanticipated still—believe it ye incredulous Judæi!—placing together in the bioscope the photographs of the "undoubted Roger" and that of the redoubted Tichborne Claimant, you will see them interchange from young to old, and from thin to stout, in the most obvious and consistent manner, whilst yet preserving in every line and feature the same exact dimensions and outline. The additional plumpness of the face, being palpably in the nature of a straight-out projection, adds nothing to the periphery, save at the margin of the lower cheek.

These results, I may add, are similar to those of the appliance known as the "identiscope;" and the time will no doubt come when every scientific photographer will see his way to the obvious inference to be drawn from the facts I have stated.—I am, sir, WILLIAM MATHEWS.

KEEPING QUALITIES OF THE PYROGALLIC DEVELOPER.

DEAR SIR,—I think the following facts concerning pyrogallic acid are worth recording, as they prove that under certain conditions this substance in solution retains its power of developing much longer than is usually supposed.

In the course of a series of experiments with developers, more than a year ago, I became aware of this property, and was so convinced of the soundness of the fact, that when we commenced the issue of our dry plates commercially, we decided on sending out the pyrogallic developer in a concentrated form along with the plates. This has proved a great success, and has practically established the fact above stated.

But we go still further than that. Last summer I made mixtures of our Nos. 1 and 2 "concentrated developers" in different proportions—equal parts Nos. 1 and 2, two parts No. 1, and one part No. 2, and four parts No. 1 to one part No. 2, and put them away in a stoppered bottle, in wooden cases, air-tight and light-tight.

No. 1.—Pyrogallic acid	... ...	1 ounce
Methylated spirit	... ...	7 ounces
Distilled water	... ...	3 ,,
White sugar	... ...	1 ounce
No. 2.—Strong liquid ammonia ·880		4 ounces
Water	... ...	2 ,,
Bromide of ammonium	...	1 ounce
White sugar	... ...	½ ,,

In those months we tested these mixtures on rapid gelatine plates, diluting, of course, with the proper proportion of water, and developed perfect negatives without a hitch. We then put them away for another three months, and about the end of December tested them again in cold dull weather, and again succeeded in producing beautifully perfect negatives; the remainder we left till last month, and tested again with success, a little slower and less density, but every detail perfect, and shadows bright.

Thus it will be seen that a mixture of concentrated pyrogallic and ammoniacal solutions can be kept, if preserved from light and air, in a state of efficiency for a considerable time.

The same weight of sugar is used as of pyrogallic acid, and a corresponding amount in the alkaline or No. 2 solution. We have found nothing as yet so good as sugar with pyrogallic, either chemically or mechanically, having tested many substances, including glycerine.

When the mixtures of Nos. 1 and 2 were first made, they at once became very dark in colour, but the depth did not appear to increase much while kept from air and light.

I may mention that the pyrogallic acid used is from Schering's, of Berlin, which comes in tins of seven pounds each. I shall be glad to hear the experience of other workers in this direction, if any. W. H. NELSON.

SEED-LAC VARNISH.

SIR,—I have mixed best seed-lac and methylated spirit for negative varnish in proportion as given in your publication two or three weeks back, and as used by Mr. England.

After mixing according to directions I allowed it to settle for three days, when there was half an inch in depth of a clear dark-coloured solution; this I gently poured off, but it was considerably thicker than negative varnish as generally sold, so it was diluted with an equal quantity of methylated spirit; it still did not flow quite as freely as I should like, so I added some more spirit, and it now flowed nicely, and dried with a nice gloss. I had altogether one and a half parts of methylated spirit to one part of the clear solution poured off.

What I want to know is, does Mr. England find it necessary to dilute to anything like the above extent, as in the particulars no mention is made of diluting? T.

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association took place on Thursday evening, the 29th ult., at the Free Public Library, William Brown Street, Mr. J. H. T. ELLERBECK, President, in the chair.

The PRESIDENT opened the proceedings with an appropriate and feeling address on the subject of the loss which the Society had sustained since the previous meeting by the death of Mr. W. Murray, the late Hon. Secretary.

The minutes of the previous meeting were read and confirmed.

Mr. E. Roberts was then elected a member of the Council, and the Rev. H. J. Palmer, M.A., Hon. Secretary, in the room of the late Mr. W. Murray.

Mr. E. ROBERTS exhibited and explained a new instantaneous shutter of his own invention. A narrow sheet of brass, slightly wider than the diameter of the lens, with an aperture fitting closely to its rim, had fixed upon it an ordinary flap shutter. Above this, and held in position by the top rim of the closed flap, was a drop shutter, falling freely, when released, in grooves affixed to the sides of the brass plate. On opening the flap in the usual way, the drop was set free, and instantly fell over the aperture of the lens. By raising the flap quickly any degree of instantaneity could be readily obtained, while by lifting it slowly a lengthened exposure could be given to the foreground of a picture, and an instantaneous one to the sky and horizon.

This new instantaneous exposer was examined with much interest by the members present; and the general opinion seemed to be that, from its portability and ready adaptability to the varying requirements of landscape work, Mr. Roberts had provided the *ne plus ultra* of instantaneous shutters.

Mr. DAY exhibited a portable camera of novel construction, made by Messrs. Newton and Co.

Mr. KIRKBY gave an interesting *resume* of his experiments with Captain Abney's method of preparing gelatino-bromide emulsions, and showed several negatives illustrating some of the difficulties of the process.

Some platinotype prints from negatives taken by the President were exhibited, and the Rev. H. J. PALMER showed a number of gelatine negatives of the interiors of St. George's, Windsor, and of St. Alban's Abbey.

An outdoor meeting was arranged for Saturday, the 8th inst., at Haughmond Abbey, Shrewsbury. The meeting was then adjourned till the last Thursday evening in the present month.

Sheffield Photographic Society.

The members of this Society, which embraces a number of the amateur and professional photographers of Sheffield and neighbourhood, made its first excursion for the season on Thursday, April 29th, to the historical ruins of Wingfield Manor, where for several months in 1569, and again in 1584, Mary Queen of Scots was detained. Wingfield presents many picturesque views, such as the photographer delights in, and though for a portion of the day the light was not very favourable, yet a number of excellent negatives were secured. After spending the best of the day about the ruins, the party adjourned to the "Manor Inn," where an excellent tea was done full justice to, and all returned to Sheffield well pleased with their excursion.

The ordinary monthly meeting was held in Nether School Room, on the 4th inst., when a goodly number of members attended. After transacting the ordinary business of the Society, the members proceeded to examine and criticise the pictures which were taken at their excursion to Wingfield, and which were taken on gelatine and on collodion emulsion dry plates. The results gave general satisfaction.

Dr. Morton then read a very interesting paper on the "Ruins of Wingfield Manor," giving its history down to the present time, and which was supplemented by some pertinent remarks by Mr. J. D. Leader.

After arranging for the next excursion, which was fixed for Haddon Hall, on May 27th, and a vote of thanks to Dr. Morton for his paper, the meeting separated.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will be held on Tuesday next, May 11th, at the Gallery, 5, Pall Mall East (where the Summer Exhibition of the Water Colour Society will be on view), when the Rev. F. W. Hardwich will read a paper on the "Oxyhydrogen Light"; and the subject of "Instantaneous Shutters" will be brought forward for discussion.

Obituary.—With much regret, in which our readers will, we are sure, sincerely share, we record the death of Mr. Henry Cooper, a frequent contributor to these pages, who died at Holmhurst, Torquay, on the 1st inst., at the early age of thirty-five.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

Studio.—In our opinion the cameras and apparatus made here are far in advance of any others. We know as a fact that much apparatus is exported from England, a very good proof of the high esteem in which it is held.

W. L.—If you will refer to the series of "At Homes" you will find much information that will be useful to you. You should certainly have side light if at all possible, and it is best to have this northerly. We have inserted your letter.

Captain Turton.—Mr. Bovey's address is 2, St. Ann's Villas, Avenue Road, Acton, W. We are glad to hear your favourable opinion.

Oxalate.—The solutions will not keep any length of time after mixing, but, unmixed, A and B may be preserved indefinitely. It may be used for a second or third plate if you like, but we should not recommend you to do so in this case, for the protosulphate is cheap, and the oxalate of potash not very expensive. If you use ferrous oxalate, it is another matter, being rather costly.

R. G.—You are right in your conclusion; more must be used, because of the solvent that is present. Roughly speaking, about double the weight is necessary.

Canvas.—We see the article in question was translated from the German, and therefore Wilde's preservative is probably German too. If you find you cannot get on without it, let us know, and we will write to the editor of the journal for you; but we scarcely think that the solution is indispensable. Of course you will never expect to get so good a result by development as you would by direct printing, but if you desire to do it by the former method, we should suggest developing the canvas in the same way precisely as paper is treated. You will find a very good alkaline developer suitable for your purpose in Abney's paper (see News of 27th Feb.) We shall be happy to help you at any time.

C. J. E wishes to know if any correspondent will oblige him with rules for working a photographic club.

C. H. Bradbrook.—We have no practical experience of the particular emulsion you mention, but it should be reliable and easy to work. Plates prepared with the emulsion ought to be as sensitive as wet plates; if it does not prove so, we should recommend you to try another maker. There are several good ones in the market.

F. G. H.—Mr. England always employs fine white gum, freshly dissolved; the Autotype Company use starch; and at other establishments a mixture of gum and glue is in favour. Marion's have a good mounting material that may be recommended. We should prefer lavender to pale green for the interior of a studio.

T. T.—Iodine dissolved in an aqueous solution of iodide of potassium applied, and the fabric then treated with hyposulphite solution, will effect what you want. You add chalk or carbonate of lime to your gold to neutralise the free hydrochloric acid contained in the chloride. It is your sensitized paper at fault, in all probability, and not your toning bath; paper purchased ready sensitized rarely gives such good tones. Why not sensitize your own paper? We shall have a "Topic" on the subject shortly, which will give you all the information you want.

W. H. Deslander.—See page 157 of our Year-Book for 1869. Your best plan, however, would be to purchase the paper, which may be had of Mr. Chapman, 113, Victoria Street, S.W.

J. Plant.—We do not understand your question. Do you wish to print from your zinc plate afterwards, as in photo-zincography, or simply apply the ordinary photographic film to a zinc surface? If the latter, this may be readily done by developing a carbon print upon it. Let us know.

James Gartside.—Thanks for your letter.

Photo-Transfer.—For collodion transfers, polish the plate with talc, collodionize, sensitize, and expose. Develop, fix, and tone with the following developer:—

Pyro	4 grains
Glacial acetic acid	30 minims
Water	1 ounce

Fix in cyanide of potassium. Tone with—

Bichlor. iridium et potass. sat. sol.		...	1 drachm
Water ...	ditto,	ditto ...	10 ounces
Gold ...	ditto,	ditto ...	1 grain

First can be obtained at Johnson and Mathey, or any good house. Transparency, after fixing, to be well washed. Toning to be carried on until both sides of the film are alike; if too heavy in deposit, weaken. In respect to opal glass, see "At Home" of this week. We shall shortly have a special article on this subject.

F. J. B.—Rue Chapon 14.

John Stone.—$8\frac{1}{2}$ by $6\frac{1}{2}$, $6\frac{1}{2}$ by $4\frac{3}{4}$, and $4\frac{1}{4}$ by $3\frac{1}{4}$.

J. W.—A three per cent. solution of cyanide of potassium will in all probability remove the stains.

Silver Printer.—Your best plan would be to send to Mr. Morley for one of his catalogues; see our advertising columns. We cannot quote you a price; you might pay anything between twenty-five shillings and five pounds for such a lens as you describe.

Thomas.—The same as Mr. Bedford specifies. We do not know where you can obtain the canary medium, but any dealer would get it for you, no doubt. Three of oxalate to one of ferrous sulphate; but we prefer Eder's proportions. See our "Correspondence" this week.

W. J. B.—See Mr. Blanchard's article this week. It is difficult to give a remedy without seeing your bath. We should suggest making up a little fresh silver solution and adding this.

F. Davidson.—Next week, we hope.

Experimentalist.—M. Leon Warnerke's address is Silverhowe, Champion Hill, S.E. Bromide of silver may exist in several forms. According to Stas, who is an authority on the subject, there are six different physical forms of the bromide.

J. Eccles.—Not unless you register.

Printer.—In January, 1873; look up the Journal of the Photographic Society for that month.

Soldier.—You have evidently boiled too much, and decomposed the gelatine. You may possibly make matters right by adding a proportion of fresh emulsion.

Bromide.—You may recover your silver from the emulsion if you like. This may be done by heating the emulsion with caustic potash and a little grape sugar, when metallic silver separates and is deposited from the solution.

The Photographic News, May 14, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photography and the Spectra of the Stars—Photographic Portrait Clubs—Photographs of Paintings—Photography and the Victoria Docks Extension.

Photography and the Spectra of the Stars.—The investigations of Dr. Huggins, whose paper on the subject read at the annual meeting of the Photographic Society will be well remembered by our readers, have been to a large extent confirmed by Dr. Henry Draper, who has for some time past been working in a similar direction. Dr. Draper has obtained photographic spectra of Arcturus, Capella, Vega, Jupiter, Venus, Mars, and the Moon, using a refractor in preference to a reflector, differing in this respect from the practice of Dr. Huggins. Owing to the difference in actinic power in the spectral lines, it is sometimes necessary to over-expose at one end in order to have lines visible at the other, and hence a difficulty in manipulation arises. Dr. Draper thinks that with a refractor the slit card may be so adjusted as to yield a spectrum tolerably wide at F and G, gradually diminishing towards H, and becoming finally almost a line at M, and thus a photograph of uniform intensity may be obtained at one exposure. There is, however, the drawback of a great loss of light, and hence Dr. Draper intends to use in future a reflector of the large size of twenty-eight inches, which will collect nearly five times the light of the twelve-inch refractor previously employed. Dr. Draper describes the spectra of Arcturus and Capella, Vega, and *a* Aquilæ as so similar to the solar spectrum, that he has not been able to detect any material differences. In this respect, so far as Arcturus is concerned, he differs from Dr. Huggins, who found the line K stronger relatively to H than it is in the solar spectrum. With regard to Vega, Dr. Draper's experience seems to coincide with that of Dr. Huggins, confirming the latter's opinion as to the preponderence of hydrogen in the atmosphere of that star. We note that while Dr. Huggins has stated his intention of endeavouring to photograph the ultra-violet part of the spectra of *gaseous nebulæ*, Dr. Draper expresses the hope that before long this will be done, for in the *gaseous nebulæ* the most elementary condition of matter will doubtless be found, a coincidence of opinion which, whether by accident or design, is worthy of remark. The spectroscope has done wonders since its invention, and it appears destined, in conjunction with photography, to assist in unlocking the secrets of nature in a way which could scarcely have been anticipated in its early days. Who would have imagined, for instance, that by means of the spectrum it could have been ascertained that Arcturus was but an ancient sun, whose light is fading, and whose fire is dying away?

Photographic Portrait Clubs.—Are portrait clubs conducive to the well-being of photography? We don't know why it should be, but, as far as as our experience goes, "club" work is nearly always of an inferior description. Systematically worked, no doubt it pays, and we can point to one instance where an absolute fortune has been made, mainly due to clubs. Perhaps those who are not in the secret are not aware where the profit comes in. Out of the number who pay their money and bind themselves over to appear before the photographer on some fitting day or opportunity, a certain percentage invariably fail to do so. They never think of the matter at the right time. they hate having their portrait taken, and put off the evil day as long as possible; they leave the country, and in some rare instances they shuffle off the mortal coil. The doctrine of averages is as true in this as in other things, and the photographer of course reaps the advantage. But somehow it does not seem possible to regard a "club" sitter in the same light as one who comes of his own free will. Perhaps the money has been paid some time before, and there is the sensation of what is known in some trading circles as "working a dead horse"; or it may be the photographer looks upon the sitter as one of a battalion whose feelings have been influenced by the persuasive powers of the promoter, and that he has been talked into coming, rather than moved thereto by the force of his inner consciousness. Whatever the cause may be, the photographer does not take the interest he would did the sitter not belong to a club, and the work suffers in consequence. And then some of the "canvassers" who tout for these club portraits! What out-at-elbows, seedy, frowsy gentlemen some of them are! We would that all photographers were flourishing, that the public were as ready to be photographed as the amiable pigs in the favoured land of Cockaigne are to be killed and eaten, and that there were no need for photographic clubs.

Photographs of Paintings.—A correspondent points out, in reference to our note last week on the Royal Academy pictures, that there would be a difficulty in the way were an artist to have his paintings photographed for purposes of sale. The copyright of a painting, according to the present state of the law, is vested in the proprietor for the time being, and that were an artist to allow copies of his picture to be sold, it would introduce complications on the original being parted with to a purchaser. He further adds that he has frequently had to photograph pictures when it was desired to preserve a memento of them, but in every case he has had to destroy the negatives in the presence of the artist. This may be so; but we do not see that the artist cannot transfer his rights to the puchaser so far as the photographs are concerned. It is obvious that whoever photographed the picture and sold the photographs would have to pay for the privilege of so doing, and the retention of the copyright by the artist, or its transferrence to a purchaser, would be a simple matter of arrangement. The publicity given to his work, to say nothing of the royalty, would certainly benefit the artist, and would rather add to the value of a picture than lessen it. There is one advantage which would most assuredly result from the sale of such photographs, and that is, they would be brought into competition with the superb productions of Goupil and other Continental copyists, and inferior manipulators could not then be tolerated. To copy a picture successfully requires the operator not merely to be a good photographer, but he must also be an artist, and know something of the relation of the tints on the canvas to each other, and of their respective actinic values. A good photograph of a good painting is "a thing of beauty," and it is a pity that artists do not recognise this more than they do. A good series of reproductions in carbon at moderate prices would, we feel persuaded, be a remunerative speculation. Indeed, we do not see why engravings of pictures should not be reproduced by the zincographic process and sold at a cheap rate. If Messrs. Brooks, Graves, Virtue, and others would only undertake this, we should hear no more of pirated prints. Those who care for the high-priced and full-sized engraving would still be able to purchase it, while the million would have the opportunity of securing a smaller-sized reproduction for a sum within their means.

Photography and the Victoria Docks Extension.—Photography is now the indispensable companion of engineering. It has been largely used in securing representations of the various stages of the work in connection with the Victoria Docks Extension. Its final task was to photograph the bed of the entrance dock immediately after the first entrance of the water. The *Times*, in referring to the circumstance, said, "The photographer is to the engineer what the shorthand-writer is to the Law Courts," a very happy comparison.

At Home.

THE KEW OBSERVATORY.

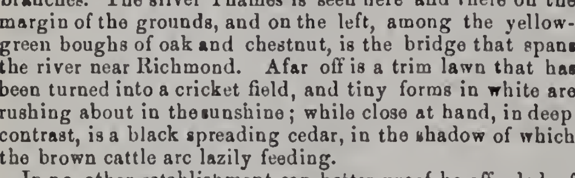
WHEN George III. was King, and the good old monarch, tired with the affairs of State, betook himself into retirement, he spent a good deal of his time at an observatory he built for himself at Richmond. It was a sort of hermitage, a white block building standing alone in the green vista of park-land and verdure, and in this quiet solitude many hours in the evening of his life were passed. Several fine telescopes were fitted up here for the old King's use, and with a few congenial companions he occupied himself in peering into the heavens and watching the movements of the planets. Some said that the King's intellect was weak, and that this last predilection of his for the moon and the stars was the symptom of a diseased brain; but there was method in his madness, if madness it was, and the scientific men of to-day have much to be thankful for to his Majesty, for he gave them Kew Observatory.

The telescopes and other astronomical instruments are no longer to be found at Kew, and it is now a magnetical and meteorological observatory *par excellence*. The establishment is under the charge of Mr. W. M. Whipple, and a more efficient superintendent it would be difficult to secure. Mr. Whipple's duties, as we shall presently see, are very varied, and when we add, that to a thorough acquaintance with the matters with which he has to deal, he unites considerable tact and an amiable and courteous disposition towards the numerous scientific and general visitors who call at the Observatory, we have said enough to prove that he is essentially the right man in the right place.

The Observatory is delightfully situated. A few minutes' walk from Richmond station you pass into a large farm, and once through this farm you are in the old Deer Park. A stretch of green meadowland is before you, and more than a mile in front, with a background of verdant foliage, is the white Observatory, the clustering trees of Kew Gardens to your right, with the quaint Pagoda rising high above their branches. The silver Thames is seen here and there on the margin of the grounds, and on the left, among the yellow-green boughs of oak and chestnut, is the bridge that spans the river near Richmond. Afar off is a trim lawn that has been turned into a cricket field, and tiny forms in white are rushing about in the sunshine; while close at hand, in deep contrast, is a black spreading cedar, in the shadow of which the brown cattle are lazily feeding.

In no other establishment can better proof be afforded of the aid photography lends to science. The art is here the handmaiden to half-a-dozen branches of science, and excellently well does it perform yeoman service. Day and night photography notes the temperature of the air, the pressure upon the barometrical column, the electric condition of the atmosphere, and the magnetical disturbances that take place in our mighty earth. A camera is ever busy watching the motion of a pencil of light which moves with every slight meteorological change, thus securing a record valuable to the world at large. Kew is in connection with seven other observatories in Great Britain, and with more than twenty situated throughout the world, and at each and every one of these stations observations go on simultaneously, which are of the utmost importance for comparison. In far-off China an observatory has been established, and Mr. Whipple showed us the first record just received from that distant station.

We will turn our attention to the thermometer first. The photographic record in this case is termed a thermogram, and here is a representation of one.



The upper line is the record of an ordinary thermometer the lower of a wet bulb thermometer. The zig-zag, as it rises and falls, indicates rise and fall of temperature, and the time of day is given by the figures above. The exact value of these zig-zag or curves, in degrees, is at once found by placing over the thermogram a glass plate, upon which is engraved certain lines and cross-lines; these lines constitute the key, and show at once the value of a curve half or a quarter of an inch in height.

Now let us look at the instrument in action. We enter a quiet darkened room, in which two shaded lamps are burning. We can see but a portion of the thermometer, but it is just that portion we want to see. It is somewhat different to an ordinary thermometer. The column is of mercury, and there is a little bubble in the column which moves up and down as the temperature varies. The thermometer, therefore, presents a perfectly opaque body, except where the bubble is. Light from a lamp shines upon the instrument, and, as a necessary consequence, the light is seen coming through the bubble as it would through a window. At every change of temperature, therefore, this little spot of light rises and falls. Now the camera comes into play. It is an ordinary lens and camera, except that, instead of a sensitized plate, there is a cylinder, round which sensitized paper is rolled. The back of the camera is opened, and we see a tiny bright spot upon the sensitized paper, the spot representing the bubble of the thermometer. There is a clockwork movement attached to the cylinder, and the sensitized paper thus gradually moves, the pencil of light making its mark the while.

At the end of twenty-four hours, or forty-eight, as the case may be, when the cylinder has made one revolution, the sensitive paper is taken out of the camera, and carried to the developing room, where a zig-zag line or curve is developed, indicative of the rise and fall of temperature during the past twenty-four hours.

The rising and falling of the barometrical column is written down by a camera in something after the same fashion, but we have to descend deep down into the basement to see this camera at work, so that the mercury column may be affected as little as possible by variation of temperature. In company with the barograph, in this cellar-like apartment, are three magnetical instruments, with cameras attached. These record the magnetical disturbances of the earth. The light in all these cases is obtained from argand gas-burners, and the moving pencil of rays is sent from a tiny mirror poised upon the magnetic needle. According as the magnets are pivoted, so they tell of the different forces in action—declination-force, horizontal-force, and vertical-force. Magnetical currents, even of a delicate nature, passing through the earth, are not without action upon these delicately-swung magnetic needles, and if the needle is affected in the least degree, the mirror in like manner moves, and thus the pencil of light is moved also. Revolving cylinders, covered with sensitive paper, here also record the movements during the twenty-four hours.

Records of this nature were first made at Kew as far back as 1858, and these were preceded by experiments several years earlier, in the days of Daguerreotype. In 1858, too, Kew first began to take its solar photographs, which have since become so famous. From 1858 until 1871 a photograph of the sun was taken almost daily, and the assistants at the establishment are said to have made no less than 5,000 measurements of sun's spots. As may be supposed, the Kew astronomical photographers possess some experience now in the matter, and they still incline to the use of wet plates for such work. To be of any value, a solar picture must be under-exposed and under-developed (in ordinary photographic parlance) and, moreover, it should not have a sharp disc-like appearance; on the contrary, towards the limb the sun-picture should gradually soften. The Transit of Venus photographs did not prove so successful as they might have been, because they did not comply with these preliminary conditions.

The hours of sunshine during the day are also recorded

at Kew. Sunshine, however, only writes itself down when it is strong enough to char paper with the aid of a burning-glass. Sunshine that is at all hazy, or sunshine in the early morning and towards sunset, when it has little power, is not recorded. The instrument is very simple. In order to have a burning-glass that will act all day, a crystal globe is employed, three inches in diameter. This is placed on the roof of the Observatory, and around, but not touching it, in a sort of bowl, is a blue strip of paper. This paper is in the focus of the globe, and when the sun shines a pencil of light chars the card to the extent of a pin's head. If the sun goes on shining all day, the hot ray of light travels gradually round the interior of the bowl, charring a line upon the paper; if the sun comes out by fits and starts, the burnt line is not continuous, but appears at intervals. At the end of the day, the card strip is removed; it is divided into sections to represent hours, and it is apparent how long and when the sun shone during the day.

We have not time here to refer to the good work done by Mr. Whipple and his assistants at Kew in respect to the testing of barometers and thermometers by the standards that are kept here; but we must just say a word upon the photographic paper that is prepared at the Observatory. The process employed is a modification of the Calotype method, and very similar to that made use of at the Royal Observatory at Greenwich. The paper is of very fine structure, and transparent, so that a second sheet may be rolled upon the cylinder, and a duplicate record secured. It is treated with iodide and bromide of potassium, sensitized on a strong silver bath that contains a little acetic acid. The development is effected slowly by the aid of gallic acid, the sheet being placed upon a glass plate and the developer poured over it, sufficient of the solution being absorbed for the operation. Sometimes three hours is taken up in development. The only difficulty that occasionally bothers the observers is the tendency of the paper to blacken. Mr. Whipple believes it is the ozone in the atmosphere; but this matter has lately been taken in hand by Captain Abney, who hopes soon to propose a better paper for the purpose.

The next "At Home" will be "On the Boulevards."

WHY THE OXALATE OF IRON DEVELOPER GRADUALLY GROWS TURBID.

BY DR. J. M. EDER.*

Occasionally I have heard complaints that my oxalate of iron developer, formed by mixing solutions of ferrous sulphate and potassium oxalate, grows turbid soon after the mixture has been prepared—that fine crystals, or more usually a yellow granular precipitate of ferrous oxalate, are deposited. Several experimenters expressed themselves to this effect at a recent meeting of the Berlin Association for the Promotion of Photography. I wish to say a few words on this subject, because the occurrence seems to have been so common as to create a prejudice against the process, and the opinion appears to have prevailed that for every plate a fresh lot of developing solution must be prepared. It has been also asserted that the old method of preparing the developer—that is, by boiling together solutions of ferrous oxalate and potassium oxalate—permitted a greater number of plates to be developed, than by my plan, as in the former the separation of ferrous oxalate was not so liable to occur.

It is quite true that, when ferrous sulphate and potassium oxalate solutions are mixed, a yellow precipitate of ferrous oxalate is thrown down, either at once, or at the end of a few minutes, sometimes even after several hours. This is due to a deficiency, more or less pronounced, in the necessary excess of potassium oxalate. According to Souchay and Lenssen the combining formula of the ferrous oxalate of potassium is $FeK_2(C_2O_4)^2$, with which are combined one or two molecules of water of crystallization. This salt, however, when treated with water, splits up into insoluble ferrous oxalate, soluble ferrous oxalate of potassium, and potassium oxalate. In order to prevent the double salt from decomposing in dissolving, it must be treated with a solution of potassium oxalate. Only in the presence of an excess of potassium oxalate will the solution remain clear, and not split up with precipitation of ferrous oxalate.* If to a solution of potassium oxalate so much ferrous sulphate be added as is only sufficient for the formation of the double salt, the solution will not remain clear, but grows turbid, with the separation of ferrous oxalate.

To keep the ferrous oxalate of potassium in solution, therefore, there must be present an excess of potassium oxalate, and that the greater in proportion as the solution is colder and more dilute. In my method the careless addition of too much ferrous sulphate decomposes the excess of potassium oxalate, and sooner or later the ferrous oxalate separates. With the old method this fault is not so likely to become visible, and that the less that the solution is allowed to settle and cool for several hours. But this can be accomplished with a better result by means of my method, inasmuch as the carelessness can be immediately detected, and its consequences repaired. The remedy, therefore, against the gradual separation of ferrous oxalate is an increase in the quantity of potassium oxalate.

As a general rule, three volumes of a 1·4 solution of potassium oxalate is sufficient for one volume of a 1·4 solution of ferrous sulphate. Should any turbidity occur in the mixture (supposing always that pure chemicals have been employed) try three volumes of a cold saturated solution of potassium oxalate—this is approximately in the strength of 1·3 to one volume of ferrous sulphate.

Another cause of my developer growing turbid may be the too high acidity of the solutions to be mixed. Neutral potassium oxalate dissolves ferrous oxalate freely; the acid potassium oxalate, on the contrary, only moderately. The addition of only a half per cent. of oxalic acid to a clear iron oxalate developing solution produces an immediate and abundant precipitate of ferrous oxalate. The direction I always give is to keep the iron oxalate developer acid, but it has happened to me to have too much of a good thing in this respect. For instance, if the ferrous sulphate solution contain too much sulphuric acid, turbidity will ensue in the developer, even when the proper proportion has been observed in the mixture.† When the oxalates of potassium and iron are boiled together, as in the old method, and there is too much acid present, there will be a deficiency of iron salt in the solution, though the operator will not detect it.

If my developer be properly prepared no cloudiness will occur; but should any such fault be observed, the solution can be rendered quite serviceable by letting it settle for just the same time as the boiled developer takes to cool. Even in this latter unfavourable condition, my developer is the best.

I trust I may be pardoned for calling this iron oxalate developer mine. I am far from wishing to diminish the credit of Mr. Carey Lea as the original discoverer; as, indeed, may be gathered from the declarations of that gentleman himself. On the contrary, in any of my writings on the subject, I have always been careful to refer to Carey Lea's original treatise. I claim for myself nothing more than the distinction of having improved the old method of preparation, and thus giving it a wider sphere of serviceableness.

* *Photographische Mittheilungen.*

* I quote these reactions from an investigation which, in conjunction with Herr Valenta, I have undertaken into the properties of the double salts of the iron oxalates, and the results of which I intend shortly to publish in their entirety.

† I have also occasionally found that even the neutral oxalate of potassium prepared for photographic purposes has been too acid. Evidently the object has been to avoid the injurious alkaline reaction, and thus the other extreme had been fallen into.

RECENT IMPROVEMENTS IN PLATINOTYPE PRINTING.—USE OF THE ELECTRIC LIGHT IN PRODUCING DIRECT ENLARGEMENTS.

BY W. WILLIS, JUN.*

Before proceeding to describe the improvements it may be well to give a short account of the chemical reactions upon which the platinotype process is based, and also a description of the methods formerly employed in practically working the process. It was discovered that a solution of ferrous oxalate in oxalate of potash, when added to a solution of a salt of platinum, instantly precipitated metallic platinum from the latter. By coating paper with a mixture of ferric oxalate and chloride of platinum, and exposing the coated paper to light behind a negative, a brown image is produced.

The light, in this case, affects one ingredient only of the coating, namely, the ferric oxalate, which is converted by its action into ferrous oxalate; the platinum salt remains unaltered. It is evident, therefore, that the coating where the light has affected it has been changed from a mixture of platinum salt and ferric oxalate to one of platinum salt and ferrous oxalate.

The brown image formed by light consists, therefore, of a mixture of platinum salt and ferrous oxalate. Now, on applying a solution of oxalate of potash to this image, the ferrous oxalate is dissolved, but so powerful a reducer does its solution form that at the moment of its formation it reduces *in situ* the platinum salt in contact with it, and thereby changes the brown image to a black one, consisting of metallic platinum.

When the process was first worked it was found impossible to obtain anything but a dull, grey, granular image, unless in addition to salts of platinum and iron a salt of silver was also introduced into the coating. If carefully worked, this method gave fine results, but it had very serious defects.

In the first place, the process was very complicated, no less than eight different operations being required. The paper was first silvered, then sensitized by iron and platinum salts, exposed to light, developed, washed in acid, then in water, then toned with sulphocyanide of gold, fixed in hyposulphite of soda, and finally washed in water. It will be readily understood that with so complex a process, failures were frequent and the results uncertain.

In the second place, the use of silver, gold, and hyposulphite of soda was in itself enough to condemn the process in the eyes of all interested in photography.

Two years ago an attempt was made to work the process without the aid of these objectionable substances, and after considerable experimenting the difficulties were overcome in the following manner. It was found that by adding an exceedingly small quantity of a salt of lead to the sensitizing mixture of iron and platinum salts, and by developing paper sensitized by this mixture of lead, iron, and platinum salts on a developer composed of a mixture of oxalate of potash and a salt of platinum, images in pure metallic platinum were obtained, having great vigour and good half-tone. The prints, after development, merely required a little washing in acid and water. This process was easily worked, the management of the developing bath being the only point which presented any difficulty. Each print developed on this bath either increased or decreased the amount of platinum in it according as the image had a small or large amount of shadow, and some experience was required to know whether the bath was or was not deficient in platinum salt. If deficient, dull, grey, granular images were produced.

About three months ago Mr. Spiller read a paper before the Photographic Society of Great Britain, on the permanence of platinotypes, in which he gave the results of a number of experiments on them. These experiments extended over a period of three mouths, and were very carefully and thoroughly carried out. He found that no chemical agent but aqua regia would affect the platinum image, and that even this agent must be used in a very energetic condition in order to produce any effect on it. The image is, therefore, practically speaking, absolutely permanent.

But in the course of his experiments, Mr. Spiller found that one of the re-agents—namely, sulphide of ammonium—slightly discoloured the white portions of the prints. Sulphuretted hydrogen did not, however, affect them. He concluded that this discolouration was due to an insoluble lead salt left in the paper, and a few tests proved that this was so.

Although the amount of lead salt contained in the sensitive coating on each sheet of paper was about a quarter of a grain only, and the discolouration produced by the action on it of sulphide of ammonia was very small, yet it was thought desirable to remove, if possible, even so small a defect, so that no element of uncertainty should remain. This has been perfectly accomplished, and moreover, in the effort to get rid of the lead salt, other benefits have accrued which render the process still easier to work, more certain, and, above all, more artistic in its results.

I will now proceed to describe this improvement, and to illustrate the manipulation connected with the development of the image.

By increasing the quantity of platinum salt used in sensitising the paper, and by omitting the platinum salt from the oxalate of potash developer, it was found that lead could be dispensed with entirely, and moreover that the results obtained without it were finer and were got with more certainty. The following description indicates the manner in which the improvement is carried out: Paper is coated with a solution containing in each ounce about 60 grains of ferric oxalate and 60 grains of platinum salt (the potassic chloro-platinite). This solution, containing nothing but salts of iron and platinum, is spread over paper by any convenient means, and the paper is then dried. The exposure to light is effected in the manner so well known to silver printers, and its duration is determined by appearance of detail in the high lights, by the general strength of the image, or by the appearance of solarization in the deep shadows, according to the character of the negative. After exposure to light the print is floated for a few seconds on a hot solution of oxalate of potash containing about 130 grains of the salt to each ounce of water. It is then washed in two baths of weak hydrochloric acid, and finally in water. The print is then finished. It will be noticed that no chemicals but those theoretically essential to it are employed in the process—namely, ferric oxalate, a salt of platinum, and oxalate of potash. It will also be observed that the process is now reduced to its simplest conceivable form.

It is found that certain variations of tone can be produced, ranging from cold black to a kind of sepia. For most purposes a warm black, several degrees warmer than that used for engravings, seems to give the best results.

An application of this process to the production of enlargements is, on many accounts, worthy of attention.

There are two methods by means of which enlargements are made. One may be termed the direct, and the other the indirect method. In this country, where sunny and unclouded days are comparatively rare, the latter or indirect method is usually adopted—that is to say, the enlargements are made in a printing frame from enlarged negatives; but in countries where sunshine is *abundant*—the United States, for example—such a costly and troublesome method is rarely, if ever, employed, and the direct method, by means of a solar camera, is used instead. Notwithstanding, however, our want of sunshine, we have in the electric light a means by which its absence may be more than compensated.

The first application of this light to direct enlarging was made in England by Mr. Cadett, but only as an experiment. His results were very satisfactory, but the method was not taken up commercially, and it was reserved for our American cousins to lead the way in this new field. In New York, direct platinotype enlargements by the electric light were produced more than fourteen months ago, and for at least ten months the process has been vigorously worked there.

In the American establishment now working this process the electric current is generated by a Weston dynamo-electric machine. The No. 2, or medium-sized machine, is made use of, but I am unable to give its candle-power. A rough estimate of the power required to drive it gave 4¼ horse power, and this was sufficient to give a current of the maximum intensity. The carbons are about half an inch in diameter, and give an arc of one-quarter of an inch in length. The light is placed in the focus of a condenser of 7in. diameter, composed of three plano-convex lenses. On the other side of the condenser, and near to it, is placed the negative. Beyond the negative, and as nearly as possible in the focus of the condenser, the photographic objective is fixed. The rays of light from the carbon points first of all traverse the condenser, then the negative, and then are driven through the objective on to the screen, on which is placed the sensitive paper. Of course, by moving this screen nearer to or farther from the objective, pictures may be diminished or increased in size.

* Read before the Edinburgh Photographic Society.

The lower carbon always burns faster than the upper, and consequently the position of the point of light is gradually lowered. To meet this difficulty the whole lamp is occasionally raised, so as to keep the point as nearly as possible in the focus of the condenser.

As the mode of working may be of interest, I will briefly describe it. We will first of all suppose that the negative has been put into its place close to the condenser, the screen removed to the proper distance to secure a print of the requisite dimensions, and the objective adjusted so as to give perfect sharpness. A sheet of rough crayon paper, to which no sizing has been applied, nor any preparation other than that given to it by the manufacturer, is placed on a sheet of glass and held there by any suitable means; then, by a pad of cotton wool, the sensitiser, consisting of a mixture of iron and platinum salts, is spread over it. As soon as the sheet has been dried, the light is turned on in the electric camera, and the sheet is secured in its place on the screen by means of pins.

The progress of the printing may be ascertained by inspection at any time by placing a piece of tissue paper in the beam of light, and thereby diffusing white light over the whole of the print. The length of the exposure, of course, varies with the character of the negative and the size of the enlargement; it usually occupies from five minutes to half-an-hour.

When the exposure is complete, the print is developed by being drawn through a hot solution of oxalate of potash, contained in a long and narrow earthenware trough. In order to finish the print it now merely requires to be washed in a weak solution of H Cl, and then in water.

BROMIDE AND CHLORIDE OF SILVER IN GELATINE EMULSION.

BY HERBERT B. BERKELEY.*

I am not certain whether I am conforming to rule or precedent in reading something very like a paper to the members of this Club, the business of which is conducted usually in a less formal manner. For my own part I feel that I can best communicate what I have to say by previously jotting down a few notes upon the various matters I propose to bring before you.

There has been some question of late as to whether mere coarseness of the silver bromide in an emulsion tends to sensitiveness.

For my own part I have always considered that comparative coarseness is, at least, a *concomitant* of sensitiveness. This belief was founded upon the fact that one great service of the film, whether of collodion or of gelatine, is to restrain the too energetic action of the developer. Now I argued that the restraining action of the vehicle would be best exercised when the sensitive salt contained in it is in the finest state of division; if so, then a larger surface of the sensitve material is brought under the influence of the restrainer.

With the conviction that the converse of this would also hold good, I proceeded to sensitise plates coated with bromised collodion in nitrate baths of various degrees of strength, diluting until it was found impossible to retain the silver bromide formed upon the surface of the film. Some of the results I now pass round. It will be seen that an immersion of one hour in a bath of ten grains' strength has resulted in many more gradations being visible than are in the plate sensitised in the bath of eighty grains' strength, and this though they were exposed for the same time and developed in the same bath side by side.

These results may illustrate to some extent the influence of the various states of division of silver bromide. Some of the plates exhibited patches of a greenish-blue bromide, and were very sensitive, but, of course, worthless for practical purposes.

With regard to the present state of our knowledge of the properties of silver bromide, it appears to me that some light might be thrown upon the precise action of heat, if means could be taken to separate all the larger particles of bromide from a boiled emulsion, until the particles under the microscope were shown to be of the same size as those in a film made from the emulsion in a less matured state. My opinion is that the sensitiveness would be found to largely depend upon the state of coarseness, though an increase in the proportion of gelatine would tend to diminish sensitiveness, and would have to be taken into consideration.

It is, or was formerly, a commonly received idea that the precise mode of development has its influence upon the state of division of the reduced silver forming the image. This may or may not have had its origin in the method of development by deposition. In one sense, indeed, the mode of development has its influence in producing a coarse image, and this is when such a strong developer is employed as to induce fogging. In this case the coarser particles are the first to be reduced, but —and this is the point—these coarse particles were present in the film before the exposure of the plate, and buried in the finer particles, which, being unreduced, are dissolved out by the hypo.

It is considered by many at the present time that long "cooking" or boiling will give the most extreme sensitiveness; and it is recommended to commence this "cooking" with an emulsion containing bromide in the finest possible state of division. Granted that this is the case, the next point is how best to obtain this quality. My experience was, that ammonia-bromide is capable of giving a finer silver bromide than can potassic bromide, but zinc bromide far exceeds either in this quality; indeed, I have prepared plates which were almost transparent, but which gave very dense images on development. Now, it seems to me that gelatine emulsion made with zinc bromide would be well suited to the "cooking" process. To those, too, who want a "slow and sure" gelatine process I would recommend the zinc emulsion uncooked.

While on the question of fine films, I may remark that it is curious that a fine silver bromide in gelatine on moistening becomes more opaque instead of more transparent, as is the case with a collodion film. In the latter case it is evident that reflecting surfaces are destroyed by being brought into optical contact by the fluid contained between them; but the behaviour of the gelatine film does not admit of so simple an explanation. Here we have the film expanded, by which the particles of bromide are separated to a greater extent than they are when the film is dry. It might be thought that the result would be to transmit the light more freely, which is not the case. Captain Abney's theory for the cause of transmitted colour will, I presume, hardly apply to this increase in opacity, for which we still seem to require an explanation. But to return to more practical matter. Some two years ago Mr. W. England communicated to the Photographic Society of Great Britain a somewhat novel action of pyrogallic acid when applied to a dry collodio-bromide film. Having an emulsion which gave a very poor image, I tried the effect of Mr. England's method upon films prepared with it, and was surprised at the very positive evidence of its influence exhibited upon development. I have not been able to lay my hands upon any good examples, but have found a piece of film which has split up, on drying, from the plate. Half the plate had been treated with a solution of pyrogallic, the other half being left without any addition. I should say that the pyrogallic in water is applied to the film when *dry*.

After various trials I came to the conclusion that, though chlorine has less affinity for silver than bromine, still silver chloride is less affected by the less refrangible rays, though I must say that I had no means of testing the matter by the spectroscope. Probably Captain Abney can enlighten us on this subject, as he has paid some attention lately to the development of silver clhoride.

Silver chloride in collodion is reduced under ordinary conditions by the alkaline developer. In gelatine this is not the case; and we can thus appreciate the restraining action of this substance. It is highly probable that, as the proportion of the gelatine to either silver chloride or silver bromide is increased, stronger developers may be employed, with probable accession of sensitiveness.

Probably the best developer for silver chloride in gelatine is hydrosulphite of soda; for, while the chloride *in albumen* is reduced by a weak alkaline developer, a clean image is developed by the hydrosulphite. If I had the opportunity I would go into the matter again; perhaps some one may be sufficiently interested to do so.

I have not been able to bring various experimental plates showing comparative sensitiveness of chloride and bromide films; it may suffice to say that. acting under the influence of my knowledge of gelatine emulsion of four or five years ago (a long time in the history of gelatine), I tried several modifications, but these only left me with results proving that in most instances neither form of emulsion exceeded the other in sensitiveness. Some further trials with silver chloride at the present time might prove interesting.

* A communication to the Photographic Club.

The Photographic News.

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CONTENTS.

DEVELOPMENT OF DRY PLATES ON TOUR.

There is one point in connection with dry plate work which has forcibly arrested our attention at the present time, and one which, no doubt, will become of considerable importance to many of our ramblers in foreign parts during the ensuing summer. It is this: the almost absolute necessity of being able to develop a certain percentage of dry plates when away on tour, and not to trust entirely to the development of them all when the outing is finished. These remarks are called for by recent accounts we have received from an amateur, who has been travelling on the Continent, of the results which he has obtained from some eighty gelatine plates. When first he went on his tour he took with him several batches of plates from the same maker, and having worked with them at home, he was perfectly satisfied that the exposure which he ordinarily gave would be such as to furnish good negatives. Placing his negatives, however, in the order of the dates on which they were exposed, we find a remarkable result. Those exposed at the beginning of the tour are rightly timed, and gradually as the series ends there are sad evidences of over-exposure—in one or two cases so marked as to render the negatives absolutely valueless. The natural query we made was as to how he accounted for this disastrous termination, and the answer was, that as time passed he began almost unconsciously to increase his exposures, till at the end of his trip he was giving ten times the amount of that with which he began it. It is not necessary for us to endeavour to philosophize over this trait in the human mind. It is sufficient to say that the sufferer was perpetually imagining that he had under-timed his exposures, and hence the increase. We know the torture that is undergone on this score, and can sympathise with him in it. Now, had he been able to develop a plate now and then, he would not have erred so seriously in the exposures; but, unfortunately, he had no means of doing so.

From this "horrid example" our readers should learn the lesson not to trust altogether to developing at home the plates exposed during a tour, but to make some small addition to their baggage to enable an occasional picture to be developed, so as to ascertain whether any great error in judgment has been committed. A small folding cardboard screen placed round a candle, and having an opening at the centre, over which a piece of ruby coloured paper has been pasted, will be sufficient protection for any plate for developing in the hotel during the evening. And here we may remark that the reflected light from the ceiling may be entirely avoided by throwing over the top of the screen a black cloth; the admission of air will be always sufficient, and the products of combustion find their way out without difficulty. The other paraphernalia necessary are a nest of (say) three ebonite or papier maché dishes, and half-a-dozen bottles of the developing and other solutions; and these will pack away in a space no larger than the camera box carried by tourists. It is not necessary that they should be often unpacked, but it will ease the mind if a plate be occasionally developed, and, as we have said before, studied. A word of warning, however, we must give, and that is, not to rely on candle-light for the necessary illumination in Norway and Sweden, and other northern countries, as in those regions in summer there is no night, it is always daylight, and to change plates from the box to the slides becomes an impossibility, unless a tent of some description is used. The most portable form we know of is the knapsack tent which originated with Mr. England, and which, we believe, he still utilizes for his dry plate work. It weighs but little, and can be set up in a very short time, and if it form part of the baggage in more southern climes, rainy days can be utilized in forming an idea of what has been "got," instead of having to wait for the exit of twilight in the long summer evenings.

EDER'S OXALATE DEVELOPER.

We gladly welcome another communication of Dr. Eder's on the subject of his oxalate developer. Within the past few weeks our readers have borne ample testimony to the efficiency and simplicity of the formula with which he has supplied them, and he now adds a few words on the subject of turbidity in the developer. This phenomenon is not unknown, and, in some cases, our correspondents have complained that a sandy deposit is precipitated on the plate during development, naturally interfering, more or less, with the cleanliness of the negative.

The turbidity and deposit are due to the same simple cause, namely, the precipitation of yellow ferrous oxalate, and is the result of carelessness in mixing the developer. If there is an excess of iron, the defect at once becomes apparent; therefore, the photographer may be sure he has more iron than he ought to have, if any turbidity or deposit is seen. Only in the presence of an excess of potassium oxalate will the solution remain clear.

For this reason it is necessary to pay particular attention to the making up of the two solutions, those of oxalate and proto-sulphate, and when they are made up, to the proportions in which they are mixed. For ourselves, we always prepare the solutions in large quantities, and then practically test the contents of the stock bottles. This is easily done. Take three parts of the oxalate and add to it one part of iron; if the mixture remains clear, all is well, and the solutions are fit for use; if there is any turbidity, then more oxalate must be put into the stock bottle.

But even if the solutions are properly made up, turbidity may, as we have said, always take place, if the proportions in mixing are slightly altered, as any one may see for himself, if he will add to the clear mixture a little more iron solution.

MR. HARDWICH ON PHOTOGRAPHIC TRANSPARENCIES.

After a lapse of nearly twenty years, Mr. Hardwich, whose name is familiar as a household word, steps once more from his retirement into the photographic world. At the meeting of the Photographic Society on Tuesday evening, he contributed a paper on the oxy-hydrogen light as an efficient means of displaying the photographic transparency, and explained, with considerable detail, the nature of the apparatus he has found most effective. His paper, as the author intended it should, brought up an interesting discussion, and since the oxy-hydrogen light is year by year of increasing interest to the photographer, Mr. Hardwich deserves our thanks for provoking so lively a debate on the subject.

In the matter of photographic transparencies, we may remark that our Exhibition Committee might with advantage take example by the French Photographic Society, who make a daily lantern display part and parcel of their annual exhibition. Photographs are never seen to better advantage than in the focus of a lamp, and their exhibition in this way is always popular.

Notes.

At the Royal Observatory, Greenwich, and also at Kew Observatory, arrangements are being made for regularly depicting the cloud formations in the camera. These cloud photographs will be particularly useful as records of changes in wind and weather.

Cheque forgeries seem to be the order of the day. Notwithstanding all the intricate printing and colouring upon our cheques, there is little difficulty, apparently, in manipulating them. Four convictions were secured during the past month, and last week the Lord Mayor was busy again listening to a charge of altering cheques. It is rarely the case that ink can be removed without leaving behind it a slight yellowish stain, and this stain is always very apparent in a photograph. For this reason the Bank of France has long since employed the sensitive plate as a detector; the camera is very sharp in finding out both stains and erasures.

It is no secret that the governors of the Bank of England are looking at the subject in a very serious light, and have resolved to adopt "Saunders patent security paper" in future. Its character is this:—When an attempt is made to remove the writing by chemicals such as those in common use, the paper turns black and dismays the forger.

Photography and the spectroscope are employed now-a-days in analysing iron and steel. At the meeting of the Iron and Steel Institute last week, Mr. W. Crawshay, of Cyfarthfa, being one of the members present, attention was called by Mr. John Parry to this subject, who said that for a period of three years he had employed photography to secure the position of the lines given by a spectrum of steel. Theoretically, Mr. Parry said, a well-focussed photographed spectrum of a steel should be an unerring index to its composition.

Mr. Henry Cooper, whose death we announced last week, at Homehurst, Torquay, in the thirty-fifth year of his age, is a name familiar to the readers of this journal. For a period of upwards of fifteen years he was a contributor to photographic literature, and that his work, both as an ardent experimentalist and as a photographer, was possessed of considerable ability, is well known. Of late years, since his residence at Torquay, Mr. Cooper's name has been less prominent before our readers, but to the last he entertained a lively interest in photographic progress, and especially in the matter of the new gelatino-bromide plates.

We are to have shellac very cheap in future. Hitherto our supply has come mostly from India, but it seems that the sage shrub, which grows abundantly in the Southern States, has been found to yield shellac and lac dye in abundance; there will be close competition with the Calcutta market if the hopes of our American cousins are realised.

Solution of silk is again brought forward as a substitute for collodion, this time by an Italian photographer, M. Silviera. M. Persoz, fils, was, we believe, the first to suggest silk for the purpose, his idea being to dissolve it in chloride of zinc. Since then Spiller has shown that the material readily dissolves in hydrochloric acid, and indeed this fact may be taken as a very simple method of testing for pure silk in fabrics, since cotton and wool are not, apparently, affected by the acid. But a film of chloride of silk will not dry upon glass; it is deliquescent, and hence hardly likely to take the place of collodion. Possibly, M. Silviera has found this out, for he is not very enthusiastic in its praise; he only talks of solution of silk as a possible substitute, like the epicure who said he could eat horse, but didn't hanker after it.

An item of statistics. There are twenty-five journals devoted to photography in the old and new world. Of these, it seems, eight are published in the German language, seven in English, the same number in French, and one respectively in Dutch, Danish, and Italian.

In the case of the eight German journals, three appear in Berlin, two in Vienna, one in Munich, one in Weimar, and one in Frankfort. Of the seven journals published in the English language, three appear in this country and four in America.

Photographic printing on fabrics is again to the fore. According to the *Figaro*, the white skirts of ladies' ball-room dresses are bordered and ornamented in front with photographs of birds printed in monochrome and in colours. The birds are of different sizes and in various attitudes, the photographs having doubtless been secured from stuffed specimens cleverly arranged.

Dr. A. Smith has presented to the Royal Society a memoir on the measurement of the actinism of the sun's rays and of daylight.

Dr. J. Emmerson Reynolds, the President of the Photographic Society of Ireland, has just been nominated by the Council as a Fellow of the Royal Society.

A remarkable meteorite has recently been added to the collection of Mr. W. E. Hidden, of the New York Academy of Sciences. It does not, however, show the Widmanstädt figures, that are usually to be seen if a section is made and this section etched with acid; as a rule, these figures or markings are taken as proof of the iron being of meteoritic origin—finger-like strata that lie at right angles to one another, and which, it may be mentioned, are very pronounced in the case of a photograph being taken of the section. The presence of Schreibersite, which is a phosphide of nickel and iron, and which forms the principal part of the residue left on dissolving the iron in acids, is also considered distinctive evidence of meteoric iron.

Topics of the Day.

THE NEW POWER.

BY H. P. ROBINSON.

It has been the fashion with writers on photography to apply the term, "a new power," to nearly every invention or suggestion made in connection with the art. This honourable title has sometimes been deserved, oftener not; but it cannot be denied that the quick gelatine plates confer a distinct and very real new power on photographers: the discovery enables them to produce, on the one hand, quite new effects, and, on the other, gives them the means of securing old effects with greater ease and certainty.

Let us consider to what new or old subjects the new method of producing negatives can be applied with advantage.

The process being much quicker than any hitherto discovered, it of course goes without saying that it is admirably adapted to all subjects which require, or will admit of, a very short exposure; those, for instance, taking that fraction of a second which it is usual, but not quite correct, to call instantaneous. It has been frequently stated that, although gelatine plates require very much less exposure in dull light, the same relative advantage would not be obtained in a brighter light. This I have not found in my own practice in portraiture. I find in the brilliant light of a good day at this time of year that ordinary commercial gelatine plates give me a portrait in about a tenth of the time required for a wet plate, and I never found them give me a greater advantage in the dullest winter days, using, of course, developer of the same strength and proportions on both occasions. This is quick enough for anything; in fact, I must confess that I do not see very clearly where a quicker plate would come in, especially for portraiture. It is well known that for a perfect portrait the sitter must be perfectly quiescent, even if the exposure should be as short as a small part of a second. It scarcely matters how short the exposure has been; if the sitter has moved there will be a certain amount of blur visible in the result. This absolute stillness is not so necessary in some other subjects. The movement of the waves of the sea has no appreciably bad effect on the picture if the exposure has been as quick as even wet plates will allow under the best conditions.

It is in every photographer's experience that he loses a certain per centage of sitters because he cannot take them quick enough, even on fine days, by the old process. Young children, nervous people, and occasionally some who are afflicted with diseases such as palsy, which prevent them sitting the necessary time, are usually the causes of these losses. This per centage is now, by aid of the new plates, either very much reduced, or wiped out altogether. Subjects that at one time I should have looked upon with despair, I now anticipate with pleasure. I enjoy a difficult subject, but I like it to be possible, and subjects that were once almost out of the question are now possible, and the merely possible of the old time are now easy.

This reduction of exposure, and greater facility for doing the work, have induced some photographers to do away with the head-rest. This, I cannot help thinking, is a mistake. As I have already said, the slightest movement causes a perceptible blur in a portrait, which, if not very detrimental in a small head, would render it unfit for enlargement, in which any little defect becomes visible; besides, I look upon the rest as a valuable aid in posing the subject. It is always desirable to know where your sitter is, and this is not always quite certain if a sort of landmark or mooring is not set up in the shape of the much-abused rest.

Whether the rapid plate will ever take the place of the wet for landscapes pure and simple is a question upon which experts have not been able to agree; but I think it possible that some modification in the manufacture will soon be discovered to enable them to give the peculiar crispness and sparkle, combined with sharpness, which are at present only attainable on collodion films or slow gelatine plates. Captain Abney's recent suggestion to add a small portion of an iodide to the bromide seems to me to be entirely in the right direction. The plates prepared in this manner, giving, as they do, clear glass for the darkest shadows, without any tendency to fog, will certainly cure the "greyness" to which the ordinary quick gelatine plates are liable; and if it be true that the Abney plates may be worked in the ordinary yellow light of the room used for wet plates, the discoverer deserves to have a statue erected to him during his life-time by the thousands of grateful photographers he will have saved from blindness.*

But if the new plates are not at present quite what they ought to be for "fresh woods and pastures," they are eminently adapted to sea views and street scenes. In these a very slight movement is of little consequence. A very little patience—of which all successful photographers have a large stock—will give the operator an opportunity of securing a street full of figures without any great blemish caused by the moving figures, and gelatine plates seem to be quite as good for architecture as any other kind. For sea views the only difficulty, as far as exposure or quickness is concerned, is to make the exposure quick enough. One of the great wants of the day is a simple apparatus for making measured exposures, varying from the duration of a flash of lightning up to two or three seconds. It should not be complicated, and should be warranted to "go off" when required. In seascapes there are moments when the waves arrange themselves into pictures, but for so short a time that the photographer must decide on the instant that *that* is his picture, and mind and hand must act together. At the next exhibition of the Photographic Society I expect to see all phases of the sea and shore represented.

There is another class of picture I think will receive more attention now that plates are more sensitive and portable. Animals and incidents of rustic life afford a wide range of subjects; it is true we have always had photographs of animals, but they have nearly always been portraits of individuals brought up for the purpose of having their likeness taken—the prize bull, the favourite horse, or the pet dog.

What I should like to see, and what I think would not be difficult to produce, are pictures of animals at home, pursuing their ordinary avocations, such as cattle in a farmyard—horses ploughing, pigs feeding, deer in a park, and (I think it possible) pigeons flying, or just alighting to be fed. It is now so easy to catch what might be called the accidental beauties of Nature. Hitherto, before the tent could be erected, and the plate prepared, the cloud that partially covered the landscape, and gave a beautiful breadth of light and shade, was gone; the figures that gave point and life to the view had moved on; or the waggoner with that picturesque waggon and team could not wait. Now nothing is required but a knowledge of what will make a picture, and a capacity —rarer than some people would think—for making up your mind.

But perhaps, and to conclude, the purposes for which quick dry plates will be found of as much advantage as anything else would be in photographing interiors. There are many places where the wet plate, with its rain of silver drops, is tabooed. Museums and picture-galleries, well-furnished houses and yachts, will now be open to photography, while, as for quality, the results will be perhaps better than ever. For instance, I have seen dozens

* Since writing the above, I have prepared some gelatine plates containing a small portion of iodide; every operation was conducted in the *yellow* light of an ordinary developing room. These plates were as sensitive as the commercial plates I have used, were clear in the shadows, and there was no flattening of the high lights. This last quality seems to me to be of the utmost importance.

of photographs of the famous Banqueting Hall at Haddon, but never anything to compare with a little picture of it I have just received, taken on a gelatine plate by Mr. Manfield, of Northampton.

The "Topic" for next week will be "So much for Employers who know nothing of the Business," by Geo. Bradforde.

THE FERROUS OXALATE DEVELOPER.

BY F. YORK.*

When I first commenced using gelatine plates I formed a favourable impression of the ferrous oxalate developer, from the circumstance of the results so closely resembling a bath plate; whereas the mind had to be educated to form a correct opinion of the printing density of alkaline pyrogallic negatives. The trouble of making the ferrous oxalate and its uncertain keeping qualities induced me to abandon it. Some time since the editors of the *British Journal* favoured us with a leading article on this subject, and gave a formula for mixing a saturated solution of protosulphate of iron—one part with three parts of a similar solution of oxalate of potash—which has worked most satisfactorily in my hands for outdoor work. Finding so few adopting it, I am induced to give the results of my experience, and to recommend those who are not using it to do so, as it is so simple, and does not require a tithe of the judgment necessary for alkaline pyrogallic.

This new formula (which Mr. W. B. Bolton informs us is an old one of Mr. M. Carey Lea's, and which ought, therefore, for distinction, to bear his name) holds in solution the by-product, sulphate of potash. I cannot find that this is of the least consequence. I have tried the two on separate sides of a stereoscopic plate, and find that Mr. Carey Lea's developed in one-third the time of the recognised formula of dissolving ferrous oxalate in oxalate of potash.

I have also tested different proportions of oxalate of potash, and find that with each addition the same results are obtained; but with prolonged development one to six takes twice as long to develop. This is contrary to Mr. L. Warnerke's experience, who said he found it more energetic with an excess of oxalate of potash. There is one advantage in using a larger proportion of the solution of oxalate of potash if it be repeatedly applied, as it prevents a deposit of insoluble ferrous oxalate, which settles on the negative like sand, requiring the application of a camel's-hair brush to remove it. This, being the active developing ingredient, ought to be in solution.

Finding that the many samples of oxalate of potash in the market varied in strength, I made some myself from oxalic acid and carbonate of potash, but I found no advantage in it. I used it in the proportion of one to three against the commercial kind, and with the same result. It is most important that the solution of oxalate of potash should be completely saturated to get the proper results. This salt is not readily dissolved in cold water, so that in order to secure saturation an excess of crystals ought to be put into a jug and boiling water poured upon them, stirred occasionally, and when cold decanted for use. Protosulphate is more soluble. It may be treated in the same way, or cold water put upon an excess of crystals and shaken occasionally. It is very important that the mixture of the two solutions should be perfectly bright. If, on mixing one part of iron to three parts of oxalate, there is a precipitate or turbidity, the oxalate is not good or not perfectly saturated. Use one to four, or five or six, until the precipitate is redissolved and the mixture perfectly bright. This precipitate, being ferrous oxalate, is the active developing agent. The proper way to mix the ferrous oxalate developer is to add the iron to the oxalate, and not *vice versa*.

Having heard many complain of the additional expense of the ferrous oxalate in comparison to pyrogallic, I have developed twelve whole plates with four ounces of oxalate and one and a-half ounces of protosulphate, the cost of which was one halfpenny a plate. Mr. Warnerke says he can develop dozens in the same solution, which, of course, would decrease the expense.

Oxalate of potash is now sold at two shillings per pound, and I am told by a manufacturer that if the demand continues it will soon be reduced to one shilling. There are various kinds of oxalates of potash—binoxalate, quadroxalate, and the neutral, which is the article required for the ferrous oxalate developer.

I have tried the relative developing power of ferrous oxalate and pyrogallic acid, and find the latter more energetic to the extent of one-third.

The following is a rough estimation of the saturating points:—Protosulphate of iron, one to three; oxalate of potash, one to four. To make four ounces of ferrous oxalate developer, take—

Protosulphate of iron	160 grains
Water	1 ounce
Oxalate of potash	7 drachms
Water	3 ounces

* A Communication to the South London Photographic Society.

Correspondence.

DEVELOPMENT OF GELATINE PLATES.

Dear Sir,—The thanks of those who use dry plates are due to you for calling attention to the very excellent and simple method of developing with Dr. Eder's preparation of ferrous oxalate. Hitherto the preparation has been a difficult one, but with merely using the solution of oxalate of potash, and of the well-known protosulphate of iron, the matter is reduced to one of extreme simplicity.

No operation requiring much experience is needed, as the plate, without wetting, is merely dropped in the developing solutions. No doubt a short time longer is occupied in development, but, on the other hand, it is not necessary to watch the operation closely the whole time, as the intensity is acquired very gradually, and with a remarkable absence of those puzzling phenomena which often accompany pyrogallic development; there is certainly less inclination to fog and veiling, and none of the yellowness often found previously. It is no small advantage that the colour of the resulting negatives is closely similar to that of collodion, and its printing value can therefore be at once estimated accurately. It must be remembered that as no allowance is to be made for greenish yellow or other non-actinic colour of film, the development should be carried sufficiently far to give a powerful image such as we have been accustomed to in wet collodion. If this is not done it may look thin and grey. Even then, fortunately, such negatives lend themselves remarkably well to the capital method of intensifying indicated by Mr. England, and more than once approved in your columns. It is simply—

Chloride of ammonia	1 ounce
Bichloride of mercury	1 ,,
Hot water	20 ounces

Weak negatives may be immersed after drying (preferably) in one ounce of this and ten ounces of water, and allowed to gradually intensify. Wash and immerse in water containing a sufficient quantity of ammonia to just give an odour.

All this reads rather difficult, but is, in fact, simple, and may, I think, be fairly stated to be the latest we know on dry plate practical working. Some may say that everlasting changes are going on, and you never know where you are; but a little consideration will show that we are all learners, and that the method above indicated forms an exceedingly simple and effective procedure.

Here let me disown any pretence of having invented anything I have written about, or discovered it first, or anything of the kind. There is one caution I should like to give before ending: the ferrous oxalate system requires more careful timing than the pyrogallic. With the latter you can with ease add bromide to over-exposed plates, and keep them from running away into those wretched thin yellow flat "unpresentable" we see so many of. I fully agree with you that ferrous oxalate should supersede pyrogallic, and also that the Continental measures of grammes, &c., should be used in place of our most difficult and uncertain system.—Faithfully yours, Samuel Fry.

PAYMENT OF ASSISTANTS.

Sir,—I did not mean to say another word on this subject, but since "An Operator of Six Years' Standing" returns to

the charge, I may be permitted to say one more word. If anything were wanted to show that "An Operator" is not true to himself, it is afforded in his last letter. He wants to know how it is possible, under present circumstances, to perfect his knowledge in photography. "As for the chemistry of the process," he says, "that is never thought of for a moment." By whom? I should like to know. Evidently not by your correspondent; and yet if he wanted to better himself in this respect, there is just now plenty of opportunity for learning photographic chemistry. I have seen several announcements of lectures in your columns only lately. I wonder how they will be supported.—Faithfully yours,

An Employer.

Proceedings of Societies.

Photographic Society of Great Britain.

The monthly meeting of the Photographic Society was held on Tuesday, at 5a, Pall Mall East, the President, James Glaisher, Esq., in the chair.

Mr. Warnerke read a paper on the "Production of Photographs by means of a Phosphorescent Surface such as Balmain's Paint."

Lieut. Darwin exhibited a negative produced by the same means. His process differed from that of Mr. Warnerke in the fact that while the latter aimed at the production of a transparency, the former produced a duplicate negative. Lieutenant Darwin's method consisted in exposing a luminous surface to light, placing it in a printing-frame on the top of a negative with a sheet of red glass on the further side, and allowing the red light to pass through the negative for ninety seconds, thus blotting out all the transparent parts, the negative being made for a gelatine plate. Lieutenant Darwin remarked that he thought the want of sharpness spoken of by Mr. Warnerke was not due to the focussing, but to the roughness of the luminous surface. If the latter was the case, he feared much could not be done with the process.

Mr. W. Bedford had made a few experiments in this direction, and had hoped to be able to make instantaneous exposures, but had found this was not possible. He believed the reason was, as stated by Mr. Warnerke, that the luminous surface was too coarse.

Mr. Warnerke observed that in his opinion the want of sharpness was due to the fact that the focus of the luminous surface, when the camera was used, was different from that of ordinary light. He had produced transparencies by contact which were absolutely sharp, though he did not think the paint as prepared by Balmain was sufficiently fine for the purpose.

The President having suggested an adjournment of the discussion of the subject until the next meeting,

Captain Abney read a paper by the Rev. F. Hardwich, on the "Oxyhydrogen Light." The chief points of the paper were that while the preparation of oxygen was not unattended with danger, the manipulations of the oxy-hydrogen lamp might with safety be entrusted to beginners. Mr. Hardwich spoke highly of the new lens recently described by Mr. Dallmeyer.

Captain Abney said he had received a letter from Mr. Hardwich in which that gentleman hoped that any member who had had experience on the subject would give his opinion as to the best angle to which the flame should be bent so as to give the best results.

Mr. Cadett could not agree with Mr. Hardwich as to the immunity from danger in the exhibition of the oxy-hydrogen lamp. Some time ago he had experienced an explosion without any previous warning, so far as the light was concerned. He had been sitting on the bag previously, but he could not see how that could have caused the explosion. It had been suggested that when he got up from the bag there was a "suck back"; but if this had been the case every one accustomed to oxy-hydrogen work knew there would have been a slight "pop" at the flame, which was not the case. He believed that after a time the gases mingled, and he would suggest that the residue of the gas in the bags after exhibition should be analysed to settle this point.

Mr. Newton said that with regard to the angle of the jet, it must not be too sharp, or a shadow of the flame would be thrown on the picture. The angle should be as short as it could conveniently be made. He quite concurred with Mr. Cadett as to the danger of inexperienced persons using the oxy-hydrogen light, and referred to several instances where serious accidents had occurred. He really thought Mr. Hardwich's statement should not be allowed to go forth to the public without some modification. In the manufacture of oxygen he considered that the delivery-pipe should be at least half an inch wide, and that granulated and not powdered oxide of manganese should be used. The latter was carried off by the steam generated, was deposited in the delivery tube, which it clogged, and hence an explosion ensued. With regard to pulverised chlorate of potash, it was quite true that it gave off oxygen rapidly, but it did not keep, and in his own practice he had found it more convenient to use it crystallized. As to the breaking of condensers referred to by Mr. Hardwich, he did not think it was due so much to the heat as to the cooling. Lantern exhibitions were generally given in the winter, and when the light was turned out, the lantern door opened, and the audience had left the room, the cold frosty air caused the condenser to cool unequally, and so a fracture followed. As to storing of gas, he did not believe oxygen could be kept in bags for more than two days, and if used after this time the common air which had got in would cause a disagreeable whistle.

Mr. Bolas remarked, with regard to Mr. Cadett's experience, that he believed the explosion was caused through inflammable dust in the bag. This dust was caused by the action of chlorine on the india-rubber, and he had known as much as half a pound to accumulate. No doubt when the pressure was removed from the bag a cloud of dust arose, and hence the explosion.

Mr. H. Baden Pritchard said the suggestion of Mr. Cadett as to the analysis of the residue gas was a very important one, and he hoped it would be carried out.

Mr. Dallmeyer hoped that for the future the name magic-lantern, as applied to the oxyhydrogen light, would be abolished, and that it would be known as the optical lantern.

Mr. Newton pointed out that the dust referred to by Mr. Bolas did not come so much from the india-rubber as from the canvas lining of the bag.

In reply to Mr. Bolas, Mr. Spiller said it was quite true that chlorine and oxygen formed a combination with india-rubber.

Captain Abney observed that a similar action was set up with ozone. He would like to ask Mr. Newton what had been his experience with condensed gases sent out in iron bottles.

Mr. Newton said that in inexperienced hands it almost always failed, because, unless very great care was exercised in turning up the jet, the pressure was so great that it frequently ripped up the india-rubber tubing. Of course, did an explosion occur through the intermixture of these condensed gases, the consequences would be very serious.

Mr. Cadett observed that, in spite of the danger, he knew a gentleman who always used the condensed gases in a mixed state.

After votes of thanks to Mr. Hardwich and Mr. Newton, an exhibition of instantaneous shutters took place.

Lieut. Darwin showed a shutter which worked by electricity. The shutter was constructed by his brother, Mr. Horace Darwin, in connection with determining the altitude of the clouds, an investigation which the Meteorological Committee of the Royal Society had undertaken. The conditions to be fulfilled were that two cameras must be exposed by the same person, and exposed either simultaneously or at variable intervals, and this shutter fulfilled these conditions perfectly.

Mr. Warnerke then gave the results of some experiments which he and Mr. Cadett had made with various instantaneous shutters. Mr. England's shutter they found required but one twenty-fifth part of a second for the sky, and one-fifteenth for the foreground. Col. Stuart Wortley's one eighty-fourth and one-sixty-seventh respectively. Mr. Harrison's shutter they could not determine, in consequence of the shaking of the camera. Mr. Rouch's double flap required one-fifteenth of a second, and Mr. Cadett's one-fifth (the weather, however, was bad in this instance). He (Mr. Warnerke) thought that the great want in an instantaneous shutter was the power of graduating the exposure from the greatest rapidity to comparative slowness, and to be able to record the length of time in each instance. Mr. Cadett was engaged on such a shutter, and would exhibit it at the next meeting.

Mr. England then showed his instantaneous shutter by means of a movable slit, in which he could vary the size and shape of the opening. A noticeable feature in Mr. England's camera was the sunshade attached in front, by means of which he could cut off the sun from the lens.

Mr. Bedford exhibited a shutter with a laterual movement, the time of exposure being one-twentieth of a secoud.

Mr. York exhibited a shutter of his own construction, and also one of Mr. Wheeler, founded on a design of Mr. Harrison.

Mr. Dallmeyer deprecated the tendency which most of these shutters had towards excessive rapidity. He believed the shutter which gave the maximum exposure with the full opeuing of the lens had yet to be constructed. Mr. England's, he thought, came the nearest to it.

Mr. Cowan exhibited two shutters, one of which opened by an ingenious adaptation of electricity.

Mr. Werge showed a shutter composed of ebonite, which was made to slide laterally by moans of weights. The time of exposure could be varied in this shutter.

The President, having referred in feeling terms to the death of Mr. Henry Cooper, announced that an alteration in the rules would be considered at the next meeting, and the proceedings were adjourned.

South London Photographic Society.

The ordinary meeting of this Society took place on Thursday, May 6th, the Rev. F. F. Statham, M.A., President, in the chair.

The minutes of the last meeting having beeu read aud confirmed, the Chairman called the atteution of members to the pictures for the monthly competition exhibited in the room, also stating he had selected, as the title for the June competition, "A Relic of the Past."

Mr. F. York then read a paper ou the "Ferrous Oxalate Developer" (page 237). In the discussion which ensued,

Mr. Warnerke said his experience with the oxalate developer was, that it produced fog; but as there was a great differeuce in the quality of the oxalate, an inferior quality might produce the fog. The best restrainer, he thought, for ferrous oxalate was citric acid. Mr. Warnerke then referred to and exhibited his sensitometer, described in last week's issue of the Photographic News..

Mr. Mawdsley remarked that the great simplicity of the ferrous oxalate would influence a great many photographers, also that the character of the image seen correspouded with the printing character. He did not think for out-door work it was so advantageous as for studio work; in the former the exposure is not so easy to hit, and unless the exposure was correctly timed, it was more difficult to get a good negative with the ferrous oxalate than with the alkaline developer.

Mr. Warnerke differed with Mr. Mawdsley in the want of latitude allowable with the ferrous oxalate, as he had seen two negatives—one exposed three times more than the other, aud both developed with ferrous oxalate—producing good negatives, with no apparent difference. An over-exposed negative could be successfully developed if bromide of potassium was added, and the developer diluted with water. As the ferrous oxalate changed by exposure, he would advocate keeping it iu a similar vessel to the one described by him at one of the meetings of the South London Photographic Society.

Mr. York said he made the ferrous oxalate and used it at once. He had found no difference in boiliug or using cold saturated solutions; in mixing, bromide would certainly check the developer. A certain amouut of bromide, no doubt, came from the negatives, as the development gradually became slower the more prolonged it was.

Mr. W. Brooks said he did not like to add free acid to the developer; he had used proto-nitrate with collocine. He agreed with Mr. Mawdsley, and said it was almost impossible to get good results unless the exposure was correctly timed.

Mr. Pearsall said there was so much adulteration in the commercial chemicals; but any one who would get pure oxalic acid and pure sulphate of iron, and mix them himself, would be sure to obtain good results.

Mr. Cowan said he did use ferrous oxalate, but had given it up in favour of Mr. Edwards' new alkaline formula.

Mr. W. B. Bolton said he had used the commonest oxalic acid, and had got the best results.

The Chairman then called the attention of the members to the presence among them of Mr. Chadwick, Secretary of the Manchester Society.

Mr. Chadwick having said a few words,

Mr. Edwin Cocking then read a paper on "The Pyramidal Form of Composition in Pictorial Works," and demonstrated upon the black board eight different subjects selected from various artists' productions, showing how each had been constructed upon the form of composition described in his paper. Owing to the lateuess of the hour no discussion ensued.

A hearty vote of thanks having been passed to Mr. F. York and Mr. E. Cocking, the meeting adjourned.

Edinburgh Photographic Society.

The seventh ordinary meeting of the current session was held in 5, St. Andrew's Square, on the evening of Wednesday, the 5th inst., Mr. John Lessels, president, occupying the chair.

The following gentlemen were elected ordinary members of the Society:—Messrs. Charles S. S. Johnstone, J. Macdonald, W. Marshall, Eugene Carnouche.

The Revised Rules of the Society recently prepared by a subcommittee of the council were read by Mr. Dobbie, and were adopted by the meeting, and ordered to be printed and circulated.

Mr. W. Willis, Jun., read a paper (see page 232) describing recent improvements in platinotype printing, and of the use of the electric light in the production of direct enlargements. The paper was illustrated by interesting experiments showing the mode of procedure, and by some finely finished examples which were hung on the walls of the room.

Mr. W. H. Davies considered the results of the recent improvements were vastly superior to the other method of platinum printing as originally practised. He considered the process as now perfected a complete success, and as the highest praise he could give it, he would say that if he were a professional photographer he would certainly discard albumenized paper for all large prints, and produce them by platinotype.

Dr. Hunter found a peculiar attraction in the delicate rendering of half tones, for which the platinotype seems specially fitted, and was pleased to find the delicate and artistic qualities as prominent in figure subjects as he had previously noted in landscapes; he thought platinum printing must eventually supersede that of silver, unless the cost precluded its general adoption.

Mr. Yerbury had tried it professionally. He exhibited several examples of his work, and directed attention to the modifications resulting from altering the temperature of the developer.

Mr. Turnbull had on a previous occasion expressed himself very favourable, aud he could not allow the opportunity to pass without reiterating his opinion that for certain classes of work the platinotype could not be equalled.

Mr. Mathison drew attention to the fact that if the same negative were printed in sunshine or shade, precisely similar prints resulted. He thought the process of great value for amateurs who ouly printed occasionally, as the tones obtained were always uniform, which was seldom the case when gold toning was employed in silver printing.

Mr. Tunny said he could not speak more favourably of the process than had been done by the previous speakers, but he had an interesting testimony to offer. He had, nearly five years ago, cut up a platinotype print, and placed portions of it in two test-tubes, one of which was filled with cyanide of potassium, aud the other with a saturated solution of hyposulphate of soda, and he produced the portions after these years of soaking. He believed there was a great future before the process, as it possessed art qualities not owned by any other. He believed the carbon prints now produced were inferior to those made years ago, as they lacked a certain liquid brilliancy which at one time was an important feature.

Mr. Lessels proposed a hearty vote of thanks to Mr. Willis for his interesting paper, and for the trouble he had taken to gratify the Society by coming out of his way to visit Edinburgh just as he was leaving England for America. On behalf of the members he tendered most hearty good wishes that Mr. Willis might have a pleasant passage, and that his business might be crowned with success.

Mr. Willis responded in suitable terms, and, referring to remarks as to the tone of platinum prints, said that one reason why a warm engraving black was adopted was, that a print in this colour, when viewed at a little distance, stood out more distinctly and with greater brilliancy than any other colour.

The following from the Question Box was next discussed:—"What is the behaviour of the two salts bromide of potassium and bromide of ammonium in gelatine plates? And what is the difference between English pyrogallic acid and German in developing gelatine plates?"

Regarding the latter, Mr. TURNBULL remarked that there was very great difference in the quality of pyrogallic obtained from both countries, but he considered the qualities of any good maker of equal value.

Mr. PRINGLE said he had invariably found Schering's German pyrogallic very greatly superior to the English.

Mr. W. K. BURTON said, in answer to the first question, that in dry gelatine plates the sensitive film consisted of a mixture of gelatine and bromide of silver. It seems doubtful whether or not the two form an organic compound, but in any case, the action of light was to reduce a certain part of the silver bromide to silver sub-bromide by the liberation of bromine. The subsequent action of the alkaline pyrogallic developer depended upon the fact that pyrogallic acid had a powerful affinity for bromine, and had a tendency to attract bromine from the bromide of silver in the film, and to leave metallic silver. On this taking place in the development of a dry plate, the liberated particles of silver attach themselves to the sub-bromide forming the latent image. This building up of the image is further assisted by the fact that molecules of bromide of silver which are in immediate contact with the molecules of sub-bromide (*i.e.*, the latent image) are more readily decomposed than those which are remote from any sub-bromide. Bromide of silver is entirely insoluble in water, but is somewhat soluble in alkaline pyrogalline (*i.e.*, in the developer used), and it is found that bromide of silver which is dissolved in the developer is much more easily decomposed than that which is not in solution; hence it followed that the more bromide of silver held in solution, the quicker will the deposit of metallic silver take place; and, in fact, if nothing be present to reduce the amount of bromide of silver in solution, this metallic deposit will be so rapid that silver will fall on parts of the plate instead of only on the sub-bromide produced by action of light, resulting in what is known as a fogged negative. Now the more bromide of ammonium or potassium in the developer, the less it will take up of bromide of silver. By adding sufficient bromide of ammonium of potassium no silver will be deposited, except where there is a powerful attraction for it in the form of the sub-bromide of the image, and we shall have a negative in which the deepest shadows are represented by clear glass. The presence of soluble bromide in the developer makes the bromide of silver insoluble in it; it is only necessary to dissolve as much bromide of silver in alkaline pyrogalline as it will take up, when, if a small quantity of bromide of ammonium is added, a precipitate is at once formed, which is bromide of silver.

Mr. DAVIES said that any one of these colloid bodies also acted as a restrainer.

Mr. AIRD thought the secondary nitrate formed in the emulsion might materially modify the results.

Dr. THOMPSON thought there was a little confusion of opinion as to the meaning of the question, which was indefinitely worded. He fancied the enquirer desired to know the advantages or disadvantages of the use of one bromide over the other. He thought they were practically the same, but he warned makers of gelatine emulsion to be careful in the removal of the secondary nitrates in either case, as they were each very deliquescent, and thus tended to produce frilling.

Mr. JAMIESON exhibited an instantaneous shutter, a combination of an old guillotine shutter he had possessed for thirteen years, with the pneumatic portion of Cadet's flap shutter.

The apparatus was most ingenious, and would evidently serve its purpose most admirably, as witnessed by several attractive portraits of children taken while playing, some being in actual motion when the exposure was made.

The usual vote of thanks terminated the proceedings.

Talk in the Studio.

DIPPER FOR DRY PLATES.—Mr. W. F. Stanley, of London Bridge, sends us a useful little instrument, which he terms a "horizontal dipper." It is a strip of glass, an inch broad and several inches long, for lifting the gelatine plate from the developing bath for inspection. The strip of glass lies under the plate, and is lifted by a loop of wire that projects at one end. It obviates the use of one's fingers, and serves, therefore, a very good purpose. It would be better, however, if the bath had a recess for the reception of the dipper, for many are calling out already about the costliness of oxalate development.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. PIPER AND CARTER, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. PIPER AND CARTER, *and crossed "Union Bank, Photographic News Account."*

E. GROVES.—The portraits are called "doubles." It is done by placing a shutter inside the camera to protect one-half of the plate whilst a portrait in one position is taken on the other; then that half is covered, whilst the originally protected half is exposed for a second position.

JAMES H.—There are no annual photographic exhibitions that we know of, except that of the Photographic Society, in October.

T. HOMES.—Thanks. We shall have much pleasure in noticing the landscapes.

E. A.—We will do our best in the matter.

ERNEST GRITHER.—You will find a leader and general description of Poitevin's process in No. 1116 of the PHOTOGRAPHIC NEWS.

ACETATE.—Do not throw the cu d away, as it contains much silver; put it with your residues. Your clear solution might be made available by strengthening it with nitrate of silver, but if it is not a very large quantity, you will do wisely to throw down the silver with salt or hydrochloric acid.

J. T. S.—Your light-yellow patch must be due, we think, to an insufficiency of developer in that portion of the plate. We doubt if it can be removed now, as it means, of course, an unequal reduction of the silver, and this inequality is hardly likely to be removed by treating the whole surface similarly. Note Dr. Eder's paper in last week's NEWS, and previous communication on defects of this kind; you will find it very useful for laboratory memoranda.

DAVISON AND CO.—We are sorry to say we cannot give you the information asked for. If you could inform us whether the glass is English or foreign we might help you.

J. S.—Distemper painting, which is always employed for backgrounds, is simply to employ an aqueous mixture to which size is added; or turpentine is now largely employed as a medium. As to the colour, whether black or grey, this can be obtained of any oilman, if you will tell him what you want. Employ your paint too light rather than too dark at first, so that you may have no difficulty about going over it again.

T. SCOTT.—It is metallic silver in a very fine state of division that is thrown down. Copper strips or zinc will precipitate most quickly, but several other methods may be used as well. Wipe the precipitate off the strip, and put the latter back in your solution. The only drawback to this mode of procedure is that it is a somewhat tardy one.

GELATINO-BROMIDE.—Your gelatine is bad; if it breaks up or disintegrates after a few hours' immersion in cold water, this is at once evidence that it is unsuitable for use.

A. R.—1. We prefer Eder's formula in using Swan's plates, and we have used it with success with gelatine plates of all sorts. 2. You will find the Calotype process mentioned in most handbooks of photography, and this, or a modification of it, is very suitable for securing paper negatives of the nature you require. "Instruction in Photography" (Piper and Carter), by Captain Abney, gives two or three methods. 3. See "Doubles" under this column in answer to another correspondent; a clever dodge, which has never received the attention it deserves for taking the sitter under a glass case, described by Mr. Woodbury in YEAR-BOOK 1872, you will find worth looking at. We have produced some very humorous results in this way, making a model appear side by side, on a mantelpiece, with a plaster model also under a glass case.

J. B.—We fear we can help you little. The plan you propose for learning the art is a very good one. It is a pity you are not in town just now, as there are two courses of photo-chemistry which you might have attended (see our advertising columns last week). An announcement in our paper might help you. Meanwhile your work shows promise. You do not light drapery nor features sufficiently—a very good fault, but still a fault. Only use the very best Rive paper for printing, and follow directions as to sensitizing bath; in a word, do not go in *for economy* or *for experiment* until you have some experience. Mr. Blanchard's paper last week on the negative bath is well worth your notice. Do not attempt groups if you can help it; one of your figures is so distant from the centre of the plate that it is impossible he could be in focus. You may expose a little more with advantage. If you work straighforwardly and persevere without having recourse to new-fangled processes, you should succeed; only, of course, if you had good instruction in a good studio it would help much. Pictures returned.

ALPHA.—See "At Home" at Messrs. Hills and Saunders last week, and the references given therein about opal enlargements, both by the carbon and powder process.

W. D.—Your letter is an advertisement; as such it should be sent to our publishers.

The Photographic News, May 21, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Is Jupiter Self-Luminous—Want of Sharpness in Alkaline Developed Plates—The Modified Woodbury Process—Instantaneous Shutters.

Is Jupiter Self-Luminous?—At the last meeting of the Royal Astronomical Society a paper by Dr. Henry Draper, of New York, was read, in which a claim was made that Jupiter is self-luminous, owing to the fact that a portion of the spectrum as photographed appeared darker in one region than did a photograph of the lunar spectrum which was placed in juxta-position. Well, we have a great idea of the capabilities of photography, but it is very hard that it should be made accountable for every defect that may be due to bad focussing or a faulty manipulation. What the phenomena was due to we cannot say, but as it has only been observed on one occasion, we can hardly suppose that just as this particular photograph was taken the planet kindly began to warm up, and subsequently revolved again. Dr. Henry Draper should tackle the question again, and see if by any possibility the same phenomenon is recorded a second or a third time, and then we shall be more inclined to take the evidence into consideration.

Want of Sharpness in Alkaline Developed Plates.—Talking of Jupiter, this naturally reminds one of the excellent photographs taken by Mr. Common, with his large reflector of that planet. We believe that after many trials Mr. Common has finally abandoned gelatine plates, as wanting in definition. This is a serious charge to make against a process, but, as was pointed out in the Photographic Journal by Capt. Abney, there is a want of definition in some cases. We have also heard that at Greenwich the same charge is brought against it, and that the old iodized collodion and pyrogallic development are considered to give better results than any other. Mr. De la Rue, we hear, still gives the preference to that process for his lunar pictures, and certainly some lunar photographs which have been developed by iron leave very much to be desired. When enlarged with the old iodide process, the enlargements only suffer from the want of accurate optical focussing, and not from irregularities in the deposit. It appears that with the alkaline developer there must always be a tendency for a lateral spread. The very nature of the action would lead to that conclusion, and we doubt if for microscopic work any process which depends on it will be able to compete with that in which the developing action takes place by deposition. We recollect well a trouble that occurred to us in photographing a scale of small dimensions; it seemed almost impossible to get defined lines on emulsion plates, owing to the spreading out of the opaque portions. The difficulty at once vanished when we used the ordinary wet process. There is a good deal of talk about bundling the bath out of the dark room now-a-days, in favour of gelatine emulsion. We do not think the time has come as yet, however, to do so, on more accounts than one; we believe that what has been called the faithful old servant, the wet process, has still a good many years of life in it, and that, like a well-known personage, it will always be retained in the establishment of any serious photographer.

The Modified Woodbury Process.—In our last number but one we mentioned that Mr. Woodbury was about to read an important paper to the French Photographic Society, but we did not feel at liberty to mention the subject on which he was to enlighten that most august and select body. The murder is out. It is on a modified process of which Mr. Woodbury himself was the discoverer. It will be in the recollection of all who have studied the question that in order to make a mould from which to produce the woodburytype pictures it was necessary to use an hydraulic press, to press the gelatine picture into soft metal. As far as we can understand, the present modification is to produce the mould by covering the gelatine picture over with tin-foil, and then to electrotype in copper over this. We believe that the success attaching to the modification has cost Mr. Woodbury much anxious study, and, judging from our own experiments on electrotyping on foil, the difficulty he has had to surmount was not a small one. It seems to us, as we ourselves suggested previously, and which, we believe, has been practically found by Mr. Warnerke, that Spence's metal will give as good a mould as the more elaborate system divised by Mr. Woodbury. The manipulation of Spence's metal is delightfully simple, if ordinary precautions are taken, and a mould may be cast in a very short space of time after the gelatine relief has been made. If there be any objection to Spence's metal, it is its extreme brittleness. A very slight tap with a hammer will break through a large block, though its tenacity is very great; it thus seems that it is better adapted for woodburytype, in which the pressure put upon it is gentle, than for typographical processes, where it frequently happens that a blow might be brought upon it. A rolling pressure, such as in automatic printing presses of some description, would inevitably break it.

Instantaneous Shutters.—The last meeting of the Photographic Society was one of great interest to all interested in gelatine, since, amongst other things, it brought to the front many novel devices for instantaneous shutters. As pointed out by Mr. Dallmeyer, however, the thing wanting is something which shall have the whole aperture of the lens to do its work during the whole time, and not a something which acts as a diaphragm to the lens. Without exception, we believe all the shutters shown did act as diaphragms, and it appears to us that the only shutter which can really be perfect is Mr. England's old pattern, which falls just in front of the plate. In this the whole lens does its work during the whole time, the shutter merely acting as a drop to cut off from exposure different portions of the plate. Mr. Warnerke made a very salient remark, however, that this kind of shutter was apt to give greater distortion to moving figures; these would be formed when the shutter was placed close to the lens. In the one case the feet of a man might be exposed for a brief interval, and the head for a different interval after the exposure for the feet was finished. This would mean that the feet of the man would be much further off from the head than it would be if the both feet and head partook of the exposure together, for a longer time, perhaps, but with a weaker light. In the two cases we have to cast a balance between sharpness and generally fuzziness of the image. The latter would be incorrect for the reason above stated, whilst the other would be more life-like, but less satisfactory to the eye. Probably it will be found that a mean position of the shutter will give optically the most satisfactory results. There can be no doubt also that an instantaneous shutter, to be perfect, should be capable of giving any exposure from a couple of seconds to (say) one-fiftieth of a second, and this can only be secured by one of two ways: either by adopting a drop shutter and regulating the velocity of its fall and its aperture, or by some electrical and prismatic arrangement, as in the shutter shown by Lieut. Darwin. Anything over two seconds may be conveniently timed by a flap shutter such as Cadett's, or by uncapping the lens in the usual manner. It is, perhaps, a misnomer to call a couple of seconds an instantaneous exposure; all we mean to insist upon is that the shutter should be capable of giving this exposure, or one very much smaller. Mr. Robinson, in last week's Topics of the Day, has pointed out that breaking waves and such objects can readily be depicted without any departure from the truth by the quick uncapping of the lens by hand, and no doubt there is great truth in the assertion; but at the same time we do not doubt that he would be the first to admit that one-tenth of a second is better than half a second when there is much movement as is to be found in street views. We have heard it remarked that a very short exposure, such as one-fiftieth of a second, would record results which to the eye would seem untruthful, and we believe this to be the case in many instances. In Muybridge's galloping horses, for example, no eye has ever been able to

distinguish the fact that all four legs are tucked up beneath the horse's belly during a particular time of the gallop, and the subject has been treated in a far different manner by artists. There is an unnatural position of the legs which is a hieroglyphic understood by every one which denotes a gallop. So when Leech used to depict the whole of a cab moving rapidly he gave the idea by showing a confused mass of lines radiating from the nave of the wheel. An instantaneous photograph would not show it thus, but every spoke would be defined more or less sharply. A certain amount of education must be given for instantaneous pictures to be understood.

VITRO-ENAMELS.

BY H. N. WHITE.*

I PURPOSE trying, if I possibly can, to create a little interest in one of the phases of photography which, I venture to think, has not received the amount of attention and study it deserves. You must not feel disappointed if my paper is not of the scientific character that might have been expected, as it is simply a narrative of my own ups and downs in relation to photography.

To commence, then: after pursuing this beautiful science for many years—indeed, almost from the very commencement, when all washerwomen were so innocent of the nature of nitrate of silver stains upon wristbands and other linen that, as one of them said, she had rubbed the skin from her fingers in order to get out the dirt, but "could na; whatever could maister have been doing?"—I found that my cupboards and drawers were getting so full of prints as to make it almost compulsory that I should turn my attention in another direction, so the next step I fixed upon was transparencies.

A conservatory lounge leading from the drawing-room offered an excellent opportunity for decoration, and accordingly I set to work and produced something like sixty 12 by 10 landscapes of English and Continental scenery. Many of these were artistically coloured in oils by a very clever artist—Mr. T. C. Dibdin, a grandson of Dibdin, the celebrated poet. These were covered with another glass for their protection, or, rather, the picture was placed face to face with the smooth side of a 12 by 10 ground glass, and the edges cemented, the whole being afterwards mounted in stained glass borders of about three inches deep, and the colours and designs were adapted to the subjects they were to border. The effect produced in the conservatory after this labour and expense was very good, and, I must say, was duly admired; but before the lapse of twelve months, to my chagrin, they all began to fade, especially those on the sunny side, which fading increased until the original outlines of the subjects could not be discerned. Here was "love's labour lost." The cause was soon apparent: mercury and ammonia were in high favour at that time for toning, and these were the culprits. I dare say that many of you have felt mortification from the same cause.

But here I may stop for a moment to observe that mercury, *per se*, does not altogether deserve the censure it has received where plates have been well washed after its application. I have several "alabastine" pictures that were taken twenty years since and more, two only of which I can prove the dates of, having written them upon the backs on the day on which they were framed. These I have the pleasure of bringing for your inspection. One is dated April 23rd, 1861, and the other April 26th, 1861—just nineteen years since—and, I believe, both retain the same vigour they had when first taken.

Well, finding my first efforts at transparencies brought to an untimely end, I determined, if possible, to obtain permanency by vitrification; but the thing was more easily said than done. At that time, so far as I am aware, no process had been introduced by which these ends were to be obtained. My process was exceedingly slow, but now and then I could get some passable pictures by the aid of silver and gold and chloride of mercury; indeed, with mercury and silver I obtained a strong picture in "orange," which took the fire well, and excited amongst a few friends at that time some little attention. I have the specimen by me now somewhere, and have looked about for it for the purpose of bringing it with me; but among the thousand-and-one things and constant accumulations, I have not been able to put my hand upon it.

* Read before the Bristol and West of England Amateur Photographic Association.

Having heard it repeatedly stated that the ancients produced a better yellow stain for glass than we can get nowadays, and also that the *old* five-shilling pieces were a few years since eagerly bought in and melted down for staining glass, owing to something in their composition which gave great lustre to the stain, but which, of course, was kept strictly secret at the Mint, I have thought it possible that mercury might have been the agent, particularly as it is not mentioned as an ingredient in the manufacture of that enamel colour. The specimen to which I refer was a splendid *bright* orange, but as that colour was not suitable for pictures in general, I turned my attention in another direction.

Later on *The British Journal*, the PHOTOGRAPHIC NEWS, and another journal the name of which I forget now—but I believe it has been extinct some time—took up this matter, and from time to time valuable hints have been given for the working of *two* processes—the one called the platinum or substitution process, and the other the powder process. The former is a very interesting method, but the throwing down the silver and substituting platinum is very tedious, involving the removal of the collodion film, its immersion in the chlorides of the metals, and its attachment to its final support, and, moreover, it is expensive and uncertain.

The powder process is very interesting also, and much more useful, as any colour or shade may be produced, or combinations of colours or shades. For a long while I have thought that if a second colour could be introduced into our paper prints, what an improvement it would be! For instance, if we could get a background in a different graduated tint to that of the portrait, how much more interesting and enlivening the whole would be, as well as giving higher relief! I am glad to see in the *British Journal* for April 16th that the Editors entertained the same views upon this subject. In writing of *Applications of the Carbon Process* they say:—"Why should enlargements always be of the orthodox brown or purple colour, so as to resemble a silver print as much as possible? Would they not be far more acceptable in the eyes of many if they were the colour of an engraving or crayon drawing, and likewise printed on rough or tinted drawing paper, so that they could be finished with crayon and stump?"

With the powder process this is of easy accomplishment. The figure would be first "tacked" or just "fixed" by fire, and any coloured background added for the second firing, graduated or otherwise. The specimens which I have brought with me this evening are all by the dry colour method.

Mr. J. Solomon, of Red Lion Square, London, taught both of these methods, and I had several lessons from him, but the results were not very satisfactory. I cannot say that we ever got one perfect picture. Both Mr. Solomon and his clever assistant endeavoured anxiously to get the best results, and I am sure kept nothing back that was in their power to impart. Certainly neither process was useful for a professional to work "commercially." The chromic salt was the great stumbling-block, forming with the hygroscopic mixture a perfectly insoluble compound in dark parts of the cliche, such as a gentleman's black coat. I believe nothing will reduce this. I have persevered with pure sulphuric acid, and also with concentrated hydrate of potash (caustic), besides many other chemicals, but nothing would remove the obstinate compound without destroying the whole picture. Such a picture, if put into the closed kiln, if only containing a *particle* of sulphur, not only will not go down itself, but will spoil every other piece that may be in the kiln with it.

Bitumen of Judea I have tried as a sensitive agent with more or less success, and have had a few good results with that; but the dissolving agents, such as benzole, naphtha, &c., &c., were both unpleasant and dangerous to use.

M. Joubert patented a process in 1860 or 1861 for producing vitrified photographs, which was partly a communication from abroad; but I have not heard whether that gentleman was very successful with it. I believe M. Joubert read a paper before the Society of Arts upon the subject; but I do not know if the paper was printed in the Society's Journal, as at that time I was not a member. In 1864 Carl Alexander Martins patented in this country a vitrifying process, being a communication from abroad by Johann Baptist Obernetter, of Munich. In this soap was used as an alkali to counteract the acid in the chrome salts. Here, also, Herr Obernetter removed the film from the support upon which it was taken in order to transfer it to its ultimate base.

(To be continued.)

At Home.

ON THE BOULEVARDS.

Paris never looks so pleasant as when you arrive hot and dusty from a day's journey. All the afternoon, during that five hours' rattle from Boulogne, you have been cooped up in a stuffy carriage with half-a-dozen fellow-sufferers; you have been pitchforked into the very middle of a sultry summer; you open the window and the sun and dust blind you; you close it, and the atmosphere is well-nigh suffocating. The glare of the sun weakens your eyes, and the fine sand gets into your ears and the pores of your skin. But it comes to an end at last, and a little before seven the big white houses of Paris grow up around you, tall black letters appear upon whitewashed walls telling of "Café Estaminet," "Fabrique d'horlogerie" and other familiar legends, and presently you are permitted to step down on to the low platform, relax your cramped form and thank goodness that the journey is over. It is then that Paris appears at its best. As you drive to the hotel in the cool evening air all the familiar phases of Paris life show their favourable side—the broad and well-watered streets, the bright shops, the bonnes in their muslin caps, the blue-bloused builders engaged upon houses of the whitest of stone, the cafés, with their active, long-aproned garçons, their cool white awnings and sprinkled asphalte, where Monsieur sits in white waistcoat and straw hat lazily sipping his coffee, or smoking the daintiest of cigarettes. Everybody is taking it coolly and enjoying himself. Your *cocher*, with his shining black hat and red waistcoat, raises his leg upon the splashboard in front, and keeps it there as he lazily drives with loose reins; the horse jogs along as pleases him, and never, for an instant, scares a little gamin with very wide trousers and shaven head, who is singing a song about being "toujours content," and escapes being run over by a miracle.

But it is about photography that we have to write. We have headed our article "On the Boulevards," and as the Boulevards are synonymous with Paris, why Paris must be the Boulevards; so we shall not apologise if we do not keep strictly to this locality in our wanderings. In the first place, then, as the result of our pilgrimage, we may inform our readers that there is distinct evidence among Parisians for a favourite photographer, and his name is Mora. Magnificent productions are to be seen in the windows of dealers, emanating from this well-known studio, which is situated, we need scarcely remind our readers, not in Paris, but in New York. When Paris itself thus acknowledges the supremacy of the American artist, there is not another word to be said, and, indeed, Mora enjoys a reputation, for small work at any rate, equal to that which Reutlinger held ten years since, and to which Fritz Luckhardt of Vienna succeeded. Another fact equally prominent to any one who has made a study of Paris photographs is that something else besides the carte and cabinet is growing popular. The format, which is known by the name of panel portrait, and by half-a-dozen others, a tall narrow picture of elegant shape, about seven and three-quarter inches long, has taken firm root in the French capital, and British photographers will do well to bear this in mind. It will never do for our travelling countrymen to become acquainted first of all with this style of portrait abroad, as was the case with the cabinet picture; in this way photographers at home lose a good deal of custom, and, unfortunately for them, there seems more opportunity for display and publicity here than in London. Certainly the panel portrait is *un fait accompli* in Paris just now, and English photographers must look to it unless they would have their customers go abroad for portraits in the new style.

MM. Adolphe Braun et Cie., of Dornach, make a very fine display of carbon printing in the *Avenue de l'Opera*. Their reproductions of paintings from most of the Art Galleries of Europe are well known, and now that the work has been accomplished, the firm have no intention of hiding their light under a bushel. Their grand gallery of prints is one of the finest sights of Paris, and well worthy of the attention of all those who study the progress of photography. The house of Goupil in the same *Avenue*, shows what may now be done in photo-engraving, and makes a brilliant display too. The same may be said of the work in photo-collographic printing which is being executed in the office of the *Moniteur* on the Quai Voltaire a few doors from our hotel. Here the admirable reproductions of pictures which have recently been issued with *Life* are produced, and here also prints by Leon Vidal's process, to which we alluded recently in these columns—photographic impressions with a substratum of colour—are perfected. The photo-mechanical prints are called phototypie, and resemble very much the delicate results of the old Garnier and Tessié du Motay process.

Mathieu Deroche, on the Boulevard des Capucines, whose name is well known in connection with good enamel work, exhibits some excellent glazed photographs. These latter seem as popular as ever in Paris. Reutlinger, on the Boulevard Montmatre, makes a strong point of them; and so does Magny, Mulnier, Pierre-Petit, and Ladrey. They are such as we have known under the name of enamelled, bombé, cameo, and medallion portraits, the surface being glazed and stamped up. *Cartes emaillées* is the usual name here. Sometimes the cameo, which is either oval or cushion-shaped, is upon a dark chocolate or grey ground—sometimes the latter is white. To our thinking, the stamping up of the picture is not without an injurious effect upon the texture of the paper, for when the surface is examined by a magnifier, it often appears broken up and unsharp. However this may be, the pictures are popular, and they must be passably well taken to begin with, for a second-rate portrait is not improved, but only looks worse for the glaze and finishing process. Reutlinger has secured some very charming effects with portraits of ladies attired in light dresses against a dark and brilliant background. The dresses are not of white material, but probably light blue, or other shade, which are rendered in the photograph of a soft pearly grey, and, therefore, with an entire absence of glare, while yet possessing great contrast with the background. We may mention, by the way, that for "cartes emaillées," half as much again is charged as for the ordinary picture; while the process of enamelling is undertaken in many cases by firms who make this a speciality. Franck of the Rue Vivienne shows some effective portraits in effective frames of dull and bright metal work.

Numa Blanc—or, rather, his successors, Germeuil Bonnaud—besides trying to imitate Rejlander's "Ginx's Baby," and failing ludicrously in the attempt, afford further subject for humour by exhibiting a huge frame of coloured portraits. Sitters attired in coats of heavenly blue, and ladies beside a tablecloth of a violent red, and all with complexions of the peach, are shown with a statement that reads "*Photographies des couleurs impressionées par la lumière.*" We can well understand that MM. Germeuil Bonnaud et Cie. do not care to hold themselves responsible for the startling colours here depicted; but to say that the light did it, is surely going rather too far. We wonder whether a sitter who *bona fide* believes that the colours here exhibited are the result of "light-printing" could be legally called upon to pay for the portraits when he found that light had nothing to do with them at all. Becquerel and Niepce de St. Victor are nowhere with these brilliant chefs-d'œuvre before us. The process is said to be patented, so there can be no secret about the manner in which the pictures are prepared, and for ourselves we should not be at all surprised if the colours were the result of aniline applied with a camel's

hair brush in the manner we have already described in these columns.

MM. Bengue et Klary—the latter well known to our readers for his clever mode of lighting—have taken an excellent portrait of Professor Nordenskiold, the Swedish explorer, and also of the captain of the *Vega*, the vessel that carried the professor from the North Sea to Japan by the North East Passage. Other attractive portraits just now are those of that *enfant gaté*, Mdlle. Sarah Bernhardt—in panel format—and the laughing picture of Madame Samary of Messrs. W. and D. Downey, that shows every tooth in the lady's head.

We do not pretend to have spoken of all the principal Paris photographers. There is Adam-Salomon, if he can still be numbered in the ranks; Lejeune, whose house still holds a very prominent position, as it has done for the past dozen years; Liébert, whose perfect establishment is one of the sights of Paris; Nadar, well known as an aeronaut and captain of balloons during the siege of Paris, as well as famous as a photographer; of these, at any rate, we must speak, to give our readers some sketch of Parisian photography of to-day. But as we cannot tell of them in this article, we shall give them a separate "At Home," and thus endeavour to do justice both to them and to our readers.

The "At Home" next week will be the "Ordnance Survey Office, at Southampton."

ON THE PYRAMIDAL FORM OF COMPOSITION IN PICTORIAL WORKS.

BY EDWIN COCKING.*

I AM afraid many think that, as the science side of photography depends upon strict laws, and, therefore, can be demonstrated and acquired by attending to the *dictum* of formula, so the art side of photography, not having its laws so strictly demonstrable, cannot be acquired; therefore it must be left to some innate powers in each individual to develop itself by a kind of chance.

This only makes it the more necessary that attention should be given to the study of the rules appertaining to art, because upon reflection it will be evident that whatever is made the subject of design must express something, and how that something may be made beautiful and more expressive is, without doubt, governed by certain rules and laws. Here I quote some words spoken by Sir James Paget, at the Royal Academy dinner on May 1st, as singularly applicable to the subject now under consideration, and in connection with photography in its aspect as an art-science. He said:—"Though Nature is the best study of both art and science, yet she is studied by them in two so widely different aspects that each needs the other for completeness. Science studies Nature in her mechanism; art in her beauty. To the one she appears as a machine, infinite in complexity, perfect in the adjustment and mutual utility of all its parts; to the other she is as a picture, infinite in variety, and everywhere perfect in its beauty."

However, as it is but vain talk to be constantly insisting upon something to be done, without showing what that something is, therefore, in response to a request expressed at one of our meetings, I will now show by some examples what can be done by attending to a few simple laws and canons of art. It may be here observed that the art-student, by devoting much time to training his hand, gradually acquires a store of facts in relation to form and other matters, which afterwards return instinctively, as it were, to his memory, and so he has laid up a capital from which he can always take a supply. But with the photographic student it is not a mattar of necessity that his hand should be trained at all, consequently his acquisition of facts must be obtained in some other way, and, as I have so often observed, this way is entirely mental; hence practical visual illustration of any rules or principles must eventually become the mode of study.

I propose, then, for consideration composition lines, which in a picture are those generic or boundary lines that help to build up the edifice or the structural idea of the subject. Now there are many forms of composition lines which may be used in a design, depending upon subject, sentiment, and individuality of the designer; but on this occasion I will only treat of the most simple, and one that is, therefore, much used, namely, the pyramidal, which, as its name implies, consists of two slanting sides meeting at the apex. Now I wish to call attention to this fact—that much will be found, if looked for amongst everyday pictorial examples, which clearly evinces that they have been produced upon this principle. Many English and German chromolithographs are in circulation which contain specimens of really good and artistic composition.

Then, again, we have in our weekly illustrated papers woodcuts from paintings, and in our illustrated serials designs by first-class artists, from which much may be learned; so that it need not be supposed it is necessary to seek the great works of art in galleries to acquire information, when in our own shop-windows can be seen art applied to works capable of being produced in thousands. I desire special attention to this point, because as one of the specialities of photography is also the capability of being produced in thousands, so the principles of art should be as applicable in one case as in the other.

It is not absolutely necessary in any composition based upon the pyramidal form to carry out the entire sequence of positive lines. In many instances they may be suggested and then broken off, but the dominant idea must always be evident; and it is just in this stage that the taste and skill of the artist are brought into action, and he can show that whilst rules have been requisite for his guidance, he can be master of them and make them subservient to his purpose.

When this form of composition is carried to its apex it is always used to give value and importance to one leading figure, the other figures becoming secondary; and it will be found that it also expresses the sentiment of dignity and repose. Where two figures are of equal value, then the apex is not used, but only suggested. Also the angular form of design may be repeated in smaller lines through the picture. This applies to the extremities of figures and any object which may be found useful to introduce as assisting the expression of the picture.

There is also another matter always associated with the pyramidal form of composition. Perpendicular or horizontal lines are absolutely necessary in the background and other places to assist in balancing the design by filling up spaces which otherwise would be not satisfactory to look at.

(To be continued.)

* A communication to the South London Photographic Society.

PHOTOGRAPHS OF CLOUDS AS METEOROLOGICAL OBSERVATIONS.

BY PIAZZI SMYTH, F.R.S.E., F.R.A.S.

(Astronomer-Royal for Scotland.)

I REJOICE to hear that both of the powerful, yet contrasting, metropolitan Observatories—the Royal, at Greenwich, and the Royal Society's and British Association's, at Kew—are believed to be making arrangements for photographing the forms of clouds regularly, as a part, and expected to be a very important part, of modern improved and daily advancing meteorological observation.

I rejoice, because I know so well from my own actual experience during several years past, not only that the thing can be done, but done with a precision which will give to meteorological science, and many other sciences too, a vast amount of exact and curious details of natural facts, which have not yet been taken account of by any of their philosophies; but are capable, for all that, of affording us new insights into Nature's wondrous modes of working, when she brings about either beneficent improvements, or destructive variations, in the ordinary conditions of the atmosphere.

But I will not merely rhapsodize in a practical matter; let me come to some of the facts. My own meteorological cloud-photographs, on the strength of which alone I speak, are contained in six boxes of small glass negatives, and ten of positive and somewhat enlarged copies, also on

glass, taken between the years 1873 and 1876 inclusive. It may be dull for those at a distance to read the mere titles of photographs, without seeing them themselves; but unvarnished and unique glass pictures of momentary phenomena which have long since passed away are not good travellers; and in this case, the simple names, as shortly as they can be put, of a very few of the subjects, will unmistakably indicate what may be ambitioned in the new departments of the two splendid and well-furnished observatories you speak of.

Thus in a box of plates harvested during the year 1873:—

No. 1 represents a view high above the house-tops of the city of Edinburgh, with sunshine, distant hills, and small cumuli dotting the otherwise clear sky. It bears the note, "Fine day, N. East wind, April 25."

No. 2 is called "The coming on of bad weather." Heavy cumuli are passing into cumulostrati, on a background streaked all over with distant cirrous bands. Also in April.

No. 3. Summer clouds with light winds, occasional showers, broken sunshine, and warm, moist weather fresh from over the Atlantic. July.

No. 4. Bright, dry, breezy! Clouds in motion like racehorses all over the sky. August.

No. 5. Summer thunder-clouds, incubating.

No. 6. A close, damp, warm evening.

No. 7. Frozen rolls of the North-West wind's peculiar clouds; solid, clear, pearly, almost silvery on their upper surfaces, but hard at the edges, grand in size and severe in shape, glorifying all the upper sky; while down below the city, the Firth of Forth, its ships, islands, and humans are smothering, choking, asphyxiating, and what not besides, in their own thick breath of dark coal smoke, which is rising up here and there above the general haze-stratum in horribly black wreaths, more worthy of the bottomless pit than what should be the fair abodes of man.

No. 8. The last light on a summer evening.

No. 9. The vorticose movement of nascent smoke as shown by the tall chimney at Leith, making cork-screw expanding whirls, opening and extending in a strong West wind over all the breadth of the city.

Again, in a box labelled 1875, I find the following notable pair:—

A¹. "Before the storm; South-West wind." A series of monster-like shapes of cumulostrati are trying to raise themselves uneasily into vertical pillars as they go drifting along in the angry wind above the Castle Hill of Edinburgh.

A². After the storm. The wind has blown itself out, the rain has rained itself out, and the last cloud in the afternoon sky is caught in the very act of dissolving away into the blue; its very substance disintegrating and floating off into little pellets on every side—"a moment white, then gone for ever."

And in the same box comes a group of three plates referring to the following rare and unusual scene:—

B¹. Showing dry clouds, something between cirrostrati and cumuli; is labelled, "As things were before the eclipse of the sun on Sept. 25, 1875."

B². "At, or immediately after the central portion of the eclipse." Said eclipse was only a partial one at Edinburgh; was not actually seen there on account of clouds, nor was any distinct temperature effect marked by the thermometer; but the clouds felt it utterly and intimately all over, for they became entirely changed in appearance in the course of a few minutes, and in this view are settling down in dense watery fog banks, and dark undefinable nimbi. Again—

B. "After the Eclipse," shows the original dry cirrostrati re-establishing themselves on high, and trying to make a beautiful "mackarel" sky.

So I might go on, indicating by the titles that some most critical turning points in wind and weather, from five to seven years ago, were secured here photographically, and with details that nothing but photography could have accomplished. But if you ask me whether I am still attending to such work, I answer "No! Having totally failed, after several years of application to Government, in obtaining for the Royal Observatory, Edinburgh, any of the necessary means for defraying the expense either of procuring the photographs from nature or multiplying copies of them for publication, I had simply to give the matter up, for I could not afford to go on any longer at my own private expense. But I did not abandon it until, I believe, all practical difficulties were overcome, and the approved means, as well as best results, openly exhibited for public criticism at the semi-international exhibition of the Edinburgh Photographic Society here in 1876.

Indeed, the camera with which most of the above views were taken was honoured on the above occasion by the Society with a silver medal, and has still this Exhibition-inscription upon it—

"No. 1031. Cloud-taking camera, uniting rapidity with definition, chiefly by the plano-concave corrector introduced into the bath-holder. By P. S., R. O. Ed., 1876."

From this note, sir, short as it is, you will probably immediately guess that many little things had to be newly arranged or invented, and tried under various circumstances, before the taking of clouds with pictorial force, and scientific definition also, was a practical success. Chief among these requirements was rapidity; for no cloud picture which occupies more than one-fifth part of a second in the taking, need be expected to bear the subsequent magnifying which is so necessary for science. To this end the daily fall of the Time-ball at one o'clock on the Nelson Monument close by was an excellent test to operate upon; and not until I had obtained fairly sharp pictures of the ball on the middle of the mast, or in the very act of accelerated falling, as well as at the top and bottom of the mast, or before and after falling, did I venture to consider the optical and mechanical apparatus, combined with the best photographical chemistry of the time, all that was necessary to enable cloud-photography to take a useful place in the business of meteorological science.

Since then, the splendid success of others in increasing the sensitiveness of gelatino-bromide has made some portions of the work much easier than it was. But even with all of that advantage, still a degree of fervour in the pursuit, of both meteorology and all physical science, as well as untiring enthusiasm for cloud-knowledge in particular, is essential in whoever works the "cloud-taking camera"; *i.e.*, if he would procure pictures that will tell—pictures that will be found utilizable for science, and be worth both publishing and preserving: for, be it known, there is no department of photography where it is so easy to obtain *bad* proofs in countless numbers as among the clouds. But, as the above-mentioned inestimable qualities of the spirit within the man will, of course, be found in perfection in the directors of the extensive observatories you have named, and will be well supported there by the magnificent endowments which Government allows with such facility to all its metropolitan or *central* offices, but makes so much difficulty about elsewhere, I may now hope that a subject in science, whose early years I did love, watch over, and even in private assist with much solicitude, is now safe to become, in other hands, a constant, for evermore, of the public meteorology of our own time, and a daily-increasing heirloom of power and interest to that of posterity.

The Photographic News.

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CONTENTS.

CLOUD PHOTOGRAPHS AT THE EDINBURGH OBSERVATORY.

The Astronomer-Royal for Scotland has been good enough to send us a very interesting account of some observations he made seven years ago in the matter of cloud science. Every landscape photographer who has occupied himself in securing cloud pictures knows very well how varied are the changes in the formation of these vapour masses. Sometimes they retain their shape for hours together, monster forms of luminous white poised in the blue atmosphere; sometimes they are but narrow rifts in the broad sky; and sometimes, again, they change shape so rapidly as they drift towards the horizon, that it is difficult to decide upon their forms at all.

Mr. Piazzi Smyth long ago conceived the notion that if we could get records of the changes in the sky they would tell much of the meteorological influences going on around us. Clouds are so sensitive in themselves, and so subject to the influence of temperature and air currents, that they never fail to indicate at an early moment changes around our earth. Indeed, as we know, weather prophets of the old school went by no other guide. The shepherd and the chamois hunter, as also the ancient mariner, who were proverbial for their wisdom in this respect, based their knowledge on cloud science; and although Mr. Piazzi Smyth only proposes to employ cloud records as one method the more of foretelling changes, and employing them in conjunction with those afforded by the thermometer, barometer, and magnetic needle, there is little doubt about his wisdom in the matter.

We refer the reader to the Astronomer-Royal's paper, which he will find singularly interesting; he will at once appreciate the aid that cloud photography may lend to meteorological science, if properly carried out. Some of the descriptions of negatives taken by the Astronomer-Royal in 1873 are very graphic. Take No 4 in the first box, for instance; "Bright, dry, breezy. Clouds in motion like race-horses all over the sky." Or No. 5 negative, which represents "Summer thunder clouds, incubating." Again, from a box of 1875 negatives, take A1, "Before the storm; S.W. wind. A series of monster shapes of cumulo-strati are trying to raise themselves uneasily into vertical pillars as they go drifting along in the angry winds above the Castle Hill of Edinburgh."

One regret alone, all must feel in reading Mr. Piazzi Smyth's paper, and that is the lack of encouragement he encountered in working out his difficult task; of its value there can be no second opinion.

THE PAYMENT OF ASSISTANTS.

Our columns have, for the past few weeks, contained correspondence on the subject of the payment of assistants. An Assistant—or Operator, as he prefers to call himself—tells us that he has now been working for six years at photography, and earns no more than thirty shillings a week. His description of himself is brief, but to the point. "I can coat plates and develop them, and do everything handy." And then he further adds, "I have not retouched much, but I can soon learn it, and also print and tone very well."

We fear our readers will agree with us in thinking that our correspondent, even on his own showing, is not a very clever man. In the first place, six years is not an extraordinarily long time for acquiring skill at any calling, and there are few assistants, we should think, unless they first of all possessed scientific or art knowledge that would be of use to them, who earn more at the end of such period of training. A draughtsman or painter who adopts photography as a calling, and applies his former knowledge to posing and lighting the sitter, or retouching the negative, might doubtless become a valuable assistant in six months, or even six weeks, while the same might be said of any one trained in a laboratory, and skilled in a knowledge of photographic chemistry. But if a young man has not had the benefit even of a good education, and is without any particular liking for the art, then we doubt very much if thirty shillings a week is too little for him to receive. *Nascitur, non fit*, may be remarked of the photographer just as well as of author and painter and man of business. If a man has no aptitude for the work, he will never learn to be a photographer. An employer soon finds out how far his assistants will carry it. One may be an excellent printer, but he will never be anything else; and another may, if he is well looked after, coat and develop clean plates. But neither can be trusted to take a good picture, either out-of-doors or in the studio, nor will they ever be capable of doing so. They work mechanically, and the employer may be satisfied that they do as they are told.

The assistant who earns "good money" is another person altogether. He has either had the advantage of an art education, or, what is better still, he has educated himself. The clever cartoonist attached to a humorous paper, which is now said to have a larger circulation in London than any other of the class, had no art education at all, in the ordinary sense of the word. He made his living as a draughtsman before he got time and opportunity for study. We were travelling with him on one occasion in the Bavarian Highlands, and he tarried for a few minutes to sketch the interior of a little chapel. "How well grounded you must have been in perspective," we said, watching his deft pencil sketching in the lines; and then he told us that he had never studied perspective in his life, but simply knew intuitively how the lines must run. So it is with many a successful photographer, who may be said to have received no art education. He has an artistic eye and artistic tastes, and knows that a thing is right or wrong without possibly knowing why. The knowledge is in him, and, acting according to his lights, he becomes a successful photographer.

But a knowledge of art alone is not sufficient for the successful photographer. He must combine this with considerable skill in manipulation, and with no small acquaintance with chemistry. It is for this reason that in large establishments we see a subdivision of work. If there is an assistant who receives ten guineas a week—the salary "An Employer" tells us is given to a gentleman in one of the Baker Street studios—we may be sure he is an artist of exceptional attainments, a man who thoroughly understands the points of a picture, and who, besides knowing how to illuminate his model, knows how the lights and shadows will be rendered by photography.

The assistant who coats and develops the plate under this principal assistant—for wet plates are not yet things of the past—is altogether of inferior rank, and would be paid, supposing he has no other strong points, a salary of not more than two guineas a week, or even thirty shillings. But an assistant capable of retouching is again on another platform, and although the value of every man here depends upon his individual capacity, four and five guineas a week are salaries usually paid by London houses to these gentlemen.

Notes.

No less than £300 has been paid by a Munich photographer for the right to photograph the actors in the Oberammergau passion play; so that, notwithstanding the firm determination expressed over and over again not to profit by the performances, the simple Bavarian villagers will make a very good thing of it one way and another, in spite of themselves.

Major James Waterhouse, the Deputy Surveyor-General of Ordnance for Bengal, is at present staying in Paris, and arrives shortly in London. For the past twelve months he has experimented, with some success, in photo-engraving.

A new application of photography. Large sums of money, as we know, are spent upon bills and posters, and Mr. Beck suggests a clever plan of showing advertisers whether these are properly displayed. His method is to photograph the London hoardings periodically, and issue prints to subscribers, who, in this way, will see at once the publicity they get in return for their money.

We encountered Mr. Woodbury in Paris on Monday, in high glee at the reception his modified process has met with in France. Bereft of long-winded explanation, his improvement amounts to this:—He presses tinfoil into the mould of bichromated gelatine, after this has been produced by printing under a negative and washing; and this tinfoil matrix, when strengthened by a deposit of copper in an electrotyping bath, serves as the printing block for printing off impressions with the usual semi-transparent ink.

Science does not command a high premium with the Government. "An open competition for one situation of junior second assistant in the Herbarium, Royal Gardens, Kew," is announced, and beyond the ordinary examination undergone by candidates for clerkships, gentlemen competing for this appointment must have knowledge of "systematic and structural botany," and to be able to name "plants by the British Flora." Moreover, candidates will be required to show what preliminary training or technical education they have undergone to qualify themselves, and must satisfy the Civil Service Commission that they possess special qualifications necessary for the office. The salary of the fortunate being who is chosen after all this examining will be £100 a year, rising, by annual increments of £10, to £150 per annum.

The print shops of Paris everywhere display photographs of the principal pictures in the Salon. Goupil reproduces them by the photo-gravure process; the Moniteur establishment by collographic printing; and MM. Braun, and other firms, by the silver and carbon processes. It will be some time yet before our Royal Academy pictures are thus freely reproduced.

The Society of Telegraph Engineers is to be favoured with a further communication by Dr. Siemens on the influence of electric light upon vegetation. Dr. Siemens is making extensive experiments with the light in his conservatory, and he hopes to show that both nurserymen and gardeners may make profitable use of the electric light in forcing the growth of fruit and flowers. Four hours' exposure to an electric light nightly, in addition to the ordinary period of daylight, suffices, it seems, to ripen fruit in half the time usually required.

Mr. Payne Jennings advocates the coating of gelatine negatives with plain collodion rather than varnishing them. He finds in printing that the paper comes away from the surface in a most satisfactory manner.

Iodide of starch plays such an important rôle in photographic chemistry, that its presence should be insisted upon in every laboratory and studio. As Mr. Spiller and Professor Vogel have pointed out, the compound affords one of the most delicate tests for hyposulphite, and the way to apply the test is very simple. You have simply to place a card or photograph in distilled water for a few hours, in order to dissolve out any hyposulphite that may be present, and if but a trace of the salt passes into the distilled water, the iodide of starch will find it out. The blue tint of the test solution vanishes quickly if the quantity of hyposulphite is appreciable, and less rapidly if there is but a trace.

Iodide of starch, as it is termed, is simply a mixture of iodine and starch. A solution of iodide of potassium is made in water, and in this is dissolved a few crystals of iodine; a little starch is added to this, and the compound is at hand.

In testing for hyposulphite, a very dilute solution is needed of a pale blue; but iodide of starch is also one of the best antidotes for poisons that we are acquainted with. Photographers should note this. In the case of unknown poisons, the administration of iodide of starch is to be strongly recommended, as also when the poison is known to be an alkaloid, or one with which iodide of starch forms an insoluble compound. It possesses, moreover, the double advantage that it has no disagreeable taste, and may be administered without harm in large doses.

We spoke the other day of ball dresses with photographic borders. One of the happiest applications of photography to fabrics was exhibited, we remember, at Pall Mall several years ago. It was a white parasol of silky texture, with black Maltese lace upon it. The Maltese lace, however, apparent as it appeared, was only illusionary, the effect being obtained by printing a black image upon the white parasol. A fine specimen of Maltese lace had been photographed, and from the *cliché* a collotype printing surface obtained. The latter was inked in the ordinary way, and impressions of the lace printed off on the white fabric. The parasol in question was exhibited by a Berlin firm, and its value, notwithstanding the apparent costliness of the lace, was but a few shillings.

BROMO-IODIDE EMULSION IN GELATINE.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

As you, Mr. Editor, have sent me several letters from correspondents asking for my formula for bromo-iodide emulsion in gelatine, I gladly place it at your disposal for publication, and I do so the more unhesitatingly as it is such a complete success in my hands that I cannot see how it can fail in that of others. I must premise that the formation of the emulsion in a fine state of division at first is absolutely necessary, as nothing subsequently will mend matters if this first important operation be not performed properly. My formula stands as follows:—

Ammonium bromide	120 grains
(Or, potassium bromide... ...	140 „)
Potassium iodide	15 „
Gelatine (Nelson's No. 1 photographic)	25 „
Water	1½ ounce

These are all mixed together, I may say, anyhow, and the temperature raised to about 150° Fah., by means of immersing the jam pot in which they are placed in a saucepan of boiling water. Next we have to prepare the silver nitrate solution, which is—

Silver nitrate	218 grains
Water	1½ ounce

This is likewise raised to the same temperature, and placed in a big test-tube, with a blow-tube attached (similar to those used for wash bottles), the orifice through which the silver solution is projected being *very* fine. To mix the two solutions, I have a glass rod, at the extremity of one end of which I attach a strip of glass a little less in length than the diameter of the jam pot, and about a quarter of an inch wide. The attachment is made by string, and before use it is thoroughly washed in hot water. In the dark room these two solutions are mixed in the jam pot, the glass stirrer being rolled backwards and forwards between the finger and thumb, and the action is so energetic that the gelatine and emulsion become a perfect froth, and the stirring is very complete. This will be seen when the emulsion is poured out into a flask (this is not necessary, but I do it for convenience sake) by no particles of a coarse nature clinging to the side of the pot. The emulsion is next boiled for twenty-five minutes to thirty minutes. I rather think the former time the better. Before boiling, I pour a drop of the emulsion on a strip of glass, and test with potassium chromate to see that there is no excess of silver. A red colouration would show that an excess was present. After boiling, the following gelatine is added to the emulsion:—

Nelson's No. 1 photographic ...	80 grains
Coignet's gold medal gelatine ...	40 „
Ordinary French gelatine ...	40 „

This is soaked, drained, and added when dissolved by heat; and after well shaking the whole is poured into a flat dish to set. In cold weather the setting takes place rapidly, but in the hot weather not so quickly. If the weather be warm, it is well to *leave out the forty grains of the ordinary French gelatine*, and soak the rest in 1¼ ounce of water, and then dissolve by heat and add. This gives the right consistency for rapid setting. (The forty grains which are absent are added to the emulsion after washing and when the emulsion is drained and liquefied. By this artifice the setting on the coated plate is made more rapid.) To wash the emulsion, it is scraped off the dish by a strip of glass, and placed in a piece of coarse canvas, and squeezed through into cold water. After resting for an hour the water is drained off, and two more changes given. It is then squeezed again through the canvas and treated with the same number of wash waters, when the soluble salts will be sufficiently eliminated. To drain the emulsion, it is simply placed in the canvas over a fire, and allowed to drip for an hour, when it can be transferred to a bottle or flask, melted up, and the plates coated in the usual manner, using about two drachms of solution for a 7½ by 5 plate. The above proportion of silver nitrate suits very near total conversion of the bromide and iodide, and accurate weighing is required, and I have sometimes used 215 grains; but I am convinced the nearer to total conversion you can go, the more sensitive the plates will be, and that without loss of density. A slight trace of bromide left in the emulsion is very detrimental to rapidity, and any unconverted bromide is very difficult to eliminate, hence the less you have of it the better. The plates prepared in this manner should, in good light, be of such a kind that, with using a diaphragm $\frac{f}{20}$, an exposure of half a second on a fairly open subject should amply suffice to obtain a negative with any detail in it. Another advantage of the presence of the iodide is, that if you give five, or even ten, seconds, the negative will still develop well without modifying the developer, and give a plucky image, a point of no small interest.

As for the developer, the ferrous oxalate is excellent, and if the old formula be used, where the saturated solution of neutral potassium oxalate is saturated with ferrous oxalate, there is a gain in rapidity of about one-sixth when compared with the ordinary alkaline developer, or Edwards' modification of it. With the mixed solutions there is a loss of one-sixth of the rapidity. For my own part, I am delighted with Edwards' developer, and sometimes develop with it, and sometimes with the ferrous oxalate.

I omitted to say that in making up the emulsion previous to coating the plates and filtering, one-eighth grain of chrome alum is added to each ounce, and also three-quarters of a drachm of absolute alcohol. The former toughens the film, and the latter aids the flow. As Coignet's gelatine is used, I coat at a high temperature (say about 120° Fah.), which gets rid of spots which are otherwise liable to occur. I do not say this is the best formula that can be used for the preparation of the plates, but I know of none other which has given such uniform and such satisfactory results. Frilling is unknown with me in this weather, and the use of the alum bath previous to fixing I find unnecessary, though occasionally I use it as a precaution.

FRENCH CORRESPONDENCE.

Mr. Woodbury's New Process at the Meeting of the Photographic Society of France—Phototypography by M. C. Petit—Instantaneous Shutter by which also the Time of Exposure can be Measured—Coloured Photographs by M. Leon Favre—The New Spence's Metal.

The New Woodbury Process.—The meeting of the Photographic Society of France on the evening of the 7th inst. was very well attended, and the papers read were unusually numerous and interesting. Mr. Stebbing gave an account of the new woodburytype process, illustrating it with a number of specimens in different stages of completion. It is not my intention to enter at any length into this subject, as the process of your clever and ingenious fellow-countryman is doubtless well known in England in all its details; but I can assure you that the communication in question was received by all my colleagues present at the meeting with every sign of a lively interest. Great was the regret that Mr. Woodbury was prevented by indisposition from himself explaining his new process. As, however, the paper was very clearly written, it was very easy to understand the description. Two important advantages seem to be gained by this new method of obtaining reliefs in gelatine, and woodburytype casts from them. First, the facility of execution, for the relief may be developed and attached to a glass plate just as easily as a carbon print, only that the layer of gelatine employed is much thicker than would be necessary

in the case of the carbon process. The composition for these new woodburytypes is composed of—

Nelson's gelatine	200 grains
Water	100 ,,
Glycerine	20 ,,
White sugar	30 ,,

and in addition a little Indian ink to give a tinge of colour. When the development is complete and the relief has become dry, it is passed through an ordinary cold press with cylinders instead of being placed under a hydraulic press to obtain the mould. This constitutes another valuable gain to be derived from the employment of the new process, namely, a considerable decrease in the first cost of the plant required. A sheet of tinfoil of sufficient strength is pressed on the relief, and on the back of the mould thus obtained a layer of copper is deposited by electrotype. This thin coating of copper is quickly thrown down, and has the effect of hardening the mould, and of preserving to it all the delicacy of the original. The mould can now be mounted on another glass plate, the electroplating having given it sufficient rigidity to keep all the elevations and depressions from altering in any way, and the mould, resting permanently on the glass plate, is not exposed to warping or distortion, as is so often the case in ordinary woodburytype lead plates, even if of small dimensions. Thanks also to this rigidity, the ridging up of any one part, and the transfer of another, are much facilitated. The prints exhibited at the meeting which had been obtained by this process were really charming, and were examined by every one present with considerable interest. I must not forget to mention that the printing surface of the mould is much more resistant than that of the ordinary lead moulds, on which the least scratch with the nail leaves a mark. The durability of a mould in tin and copper will also be much greater than that of one in lead. Mr. Woodbury's process met with so favourable a reception at the hands of the meeting as would seem to promise its general adoption. He will certainly have rendered a great service to the art of printing, by placing at the disposal of every one a method as simple and economical as it is ingenious and effective.

New Process of Phototypography.—M. C. Petit has just started his process of photography—*similigravure*, as he calls it—as a commercial undertaking. At the meeting of the Photographic Society he exhibited a number of proofs printed by this process, accompanied with a description explaining so fully the details as to make it easily understood by every one. I can scarcely say that, in its present state, the process is capable of producing altogether satisfactory results. As the inventor himself confesses, there is still much to be done by retouching, but that is only a question of the difference in cost between one of M. Petit's plates and one produced by engraving by hand. In previous correspondence I have given a summary of this process; as will be recollected, it consists essentially in transforming, by means of lines ruled and hatched mechanically, a photographic print, in which the half tints are continuous, into one in which they are broken by the cross-hatching. Unfortunately the process is, as I think, rather complicated. It requires the following successive operations:—(1.) From the original negative a relief is taken in gelatine by the Woodbury process; (2), a matrix is obtained from this relief in white wax, capable of becoming hard, and sufficiently resistant; (3), this matrix in white wax (blackened with plumbago) is cross-hatched by means of a ruling machine with a V-shaped cutting tool, which is regulated so as to reach the lowest parts of the depressions of the matrix; in this way the lines traced by it are thicker in proportion as it touches the bottom of a deeper hollow; these furrows of course are white, leaving the raised lines black; (4), this effect having been produced, according to wish, a negative, either of the same size, or reduced, is taken from the hatched plate of wax; (5), from the negative again an impression is taken in bitumenized zinc, which is developed and etched in the usual way; (6), finally the zinc plate is retouched. M. Petit has modified the process by employing paper with lines raised in its texture, like that used in the establishment of M. Gillot. In this case he presses his relief against this paper, and the lines which touch the raised parts are blackened, thus producing a picture like a line engraving; from this again a negative is taken, which is transformed as before into a zincographic plate. I intend to ask M. Petit to let me have a number of his typographic plates, and shall place them at the disposal of the Editor of the Photographic News, to show to any of his readers who may wish to see the results of this method of working. M. Petit is continually trying to improve his process, and I can only express a hope that he may succeed in reducing the number of operations. Considering that the results of this process are still very incomplete, it seems to be really a great deal too complicated.

An Instantaneous Shutter for Measuring the Time of Exposure.—The peculiarity of M. Jubert's shutter is that the opening is square or rectangular, instead of circular. He proves that a square aperture alone allows the whole of the lens to do its work. The slide which carries the opening moves in front of the lens in a vertical groove, and falls more or less rapidly according as the weight attached to its lower end is greater or smaller. If, instead of a square aperture, a rectangular one be used, the lens will be exposed for a longer time, though the duration of the fall will be the same. By regulating the weight which determines the fall, M. Jubert has succeeded in graduating the length of the exposure, so that he can produce twice, three times, or four times the velocity. According to the conditions of sensitiveness and illumination to which operators are subject, this is not only advantageous, but positively indispensable. This method of measuring the duration of the exposure seems to me to be a very simple one; it will be a means of avoiding many complications in the case of travelling apparatus. I should advise the manufacturer who intends to produce lenses provided with this shutter not to neglect the appendage for graduating the necessary velocity, until an exposure of a tenth, or even a twentieth of a second can be attained.

Coloured Photographs.—We have yet another process for producing painted photographs; it is that invented by M. Leon Favre, but it contains nothing new in principle. A carbon print is painted on the back in oil-colour, and the layer of collodion is then removed from the glass plate, bringing with it both the print and the painting. M. Favre, however, has foreseen that the taste of a sitter in the matter of colour can scarcely be relied on; so he has contrived a method of scratching off any one tint to substitute another, which may be more pleasing, without in any way altering the photograph. The way he manages this is, I believe, by means of a layer of gelatine, with which the carbon print is coated, before it is painted on.

Spence's Metal Applied in Photography.—I may be permitted to utilise the few lines for which I still have space to say a word or two on my experiments with "Spence's metal." To Mr. Warnerke's kindness I am indebted for some specimens of this substance, from which I have been able to obtain an idea of its value for photographic purposes. It appears to me to behave very much like sulphur, but has one advantage over the latter, inasmuch as it gives harder surfaces or moulds. Our Editor, as also Mr. Warnerke, believe that this property may be made use of in producing moulds for the Woodbury process; I prefer to suspend my judgment, though, I confess, it appears to me to be a matter of difficulty, not so much to get the impression itself, as to produce it in such a state as to satisfy the other conditions of the process.* What appears to me to promise better is the process of developing images in carbon or in bitumen, and obtaining from them typographic plates by means of carbon sulphide.

Leon Vidal.

* There is much talk over here about typographic plates produced in a substance called celluloid. This substance softens with heat, and yields a mould of great hardness. It seems to be well adapted for photographic purposes; as is also the cement of M. Jannin, which is a composition of the yellow oxide of lead and glycerine.

WORKING GELATINE DRY PLATES.

BY CAPT. FRANCIS W. TURTON, R.N.

There have been a good many hints on the working of gelatine plates lately in your valuable journal, especially as regards intensifying. I have tried many of these experiments, and wasted a good deal of time over very worthless plates and disappointing formulæ that have proved veritable Will-o'-the-Wisps leading into quagmires of yellow and spoilt plates in great numbers.

Some gelatine plates take very long to fix—a great fault—and, of course, require great washing afterwards; nor will they intensify.

Edwards' intensifier I have found very excellent to produce chrome yellow negatives, but useless for any other purpose, with a few exceptions.

I find Mawdsley's plates very workable in every way—excellent with the oxalate developer, quickly fixed, and last, not least, if they should be weak from over-exposure, any amount of intensity can be got with England's or Abney's intensifier—bichloride of mercury and ammonia.

I have lately experimented on a number of these plates—have varnished and printed from them, and have taken off the varnish with alcohol, and intensified them to any amount afterwards. They are very good for transparencies with oxalate developer, and with Edwards' ammonia and glycerine developer give fine transparencies with a rich brown tone.

Those who have been using the oxalate developer will not be likely to give it up. Its facility in making, and being ready for use at a moment's notice, are very great advantages, and it will keep for several weeks mixed, though it gets after a month rather slow in working.

As regards the keeping qualities of some gelatine plates, I would mention Bennett's. I lately opened two dozen of quarter-plates of Bennett's that had been in my studio two years, and the plates worked with oxalate developer perfectly, and intensified with bichloride of mercury and ammonia intensifier to perfection, looking exactly like a good wet plate with clear shadows and every gradation of distance and light and shade. I have not seen any statement in the journals or Year-Books of the keeping qualities of gelatine plates equal to this; in fact, Bennett's plates were some of the first in the market, and were brought out conjointly, I think, with Mr. Mawdsley's a little over two years ago.

Very good window transparencies can be made with these plates with oxalate developer, and made a brilliant black with England's intensifier. They can be coated with Swan's matt varnish, either back or front, and thus require no ground glass to back them up with. I find ordinary crystal varnish very suitable for these plates, applied cold, and they can be printed, almost as soon as the varnish is on.

It is very unsafe to print from any gelatine negative without varnishing, as the negative will be spoilt by stains and spots from the silver paper. I have used a very good crystal clear varnish supplied by Mr. Werge, which is quite transparent, and easily applied.

There has been a good deal of rubbish talked and written about the small quantity of light—and that ruby—that could safely be used with gelatine plates. All I can say is, that I was much surprised to see Mr. Croughton, at Lowestoft, work some of Swan's and Mawdsley's rapid plates in a yellow light that seemed hardly safe for wet collodion plates; but there was no fog in the negatives, and I have found the same myself in practice.

As regards an amateur printing from his own negatives, I would say a word in favour of Durand's excellent ready-sensitized paper. It will keep many months—indeed, I have lately produced passable prints from paper that had been in my printing-frames for eighteen months at least. I have used this paper for the last ten years, and there is none equal to it. The gelatine rapid process has made quite a revolution in photography, and I have lately induced a gentleman who had given up photography for some years, to take to it again. The sight of the gelatine plates, and the other great facilities now available for amateurs, quite re-inspired him, and he has sent for his plates, and made up his oxalate developer.

If Captain Abney's promised process with iodide will enable the rapid plates to be worked safely with a little more light, so much the better; but there is at present no need at all for working in the dark.

With exposures of from five to fifteen seconds I have lately got good negatives of ordinary rooms with groups of figures seated or standing. These pictures were impossibilities two or three years ago, and persons who know nothing of photography are much pleased and surprised at seeing them.

Photographers can now make enlargements by gas-light. I succeeded lately with a gelatine plate in getting an enlargement in the camera by an ordinary gas-burner, with frosted globe, in five minutes—a Mawdsley plate, alkaline developer, about five diameter enlargement.

The oxalate developer seems to work well with all gelatine plates. It has succeeded with all those I have tried with it—Swan's, Fry's, Bennett's, Mawdsley's, and Shew's "Standard" plates. This fact alone should make it popular. I have tried several other makers' plates—Nelson's and Prestwich's—but not with the oxalate developer; probably it would suit these plates also for development. It would be a great thing if a uniform development were applicable to *all descriptions* of gelatine dry plates instead of each maker having some little difference in formula from the rest.

The oxalate developer I refer to as keeping for at least a month was prepared by Mr. Werge. I do not think that the oxalate developer as prepared in the ordinary way will keep so long, and Mr. Werge's works slower as it grows older.

I see in last week's News that Mr. H. P. Robinson has tried the addition of iodide to gelatine emulsion with success in the direction of enabling more light to be used in the developing room. This is very important to all rapid plate workers. Let the commercial gelatine plate manufacturers at once follow suit, and give us plates that can be worked with comfort, and without injury to the eyesight.

Correspondence.

PAYMENT OF ASSISTANTS.

Sir,—Your correspondent, "An Operator of Six Years' Standing," complains that "Beau Nash" and "J. Kay" do not give practical advice, and asks how he is to learn photography properly.

My advice is, that in addition to energy and industry in his everyday work, he should add close, careful observation, and also employ his spare time in the careful study of some good work on photography, say Abney's "Instruction in Photography."

With regard to retouching, I would caution him against the idea that it is so easily learnt as he seems to suppose. His shortest way to learn the art would be to take lessons from some good professional hand; failing this, he should endeavour to obtain the assistance of some kind friend who has a fair knowledge of the subject; after which he should perfect himself by practice.—Yours truly,

Thos. Forrest.

Sir,—If your correspondent of "Six Years' Standing" will take another operator's advice, he will dismiss the idea of £10 weekly from his mind (no one told him he would get it, however competent), as I can tell him, without fear of contradiction, that the average salary to competent men,

able to take a good picture, and retouch well, is from £2 to £3 weekly.

To improve, he should get a situation as assistant operator, give his mind to it, and if one situation does not give him scope enough, try another, read Capt. Abney's work, and determine to improve.

The employers' letters are nothing to the purpose. Every one knows that a few have £5 or £6 weekly, or more, perhaps, if they are first-class colourists as well as photographers; but such places are few.

"Beau Nash" and "J. Kay" imply that assistants have only to ask for a rise and get it, and that good men always get good berths. From experience I know better. As a class, I think assistants are underpaid, but so long as hundreds can be got for thirty shillings weekly, I expect they will remain so.—Yours respectfully, H. B.

CANARY MEDIUM *v.* RUBY GLASS.

SIR,—In the columns of your valuable paper of May 7th I see there is a great deal of doubt as to the safety of the *canary medium.* It seems to me as if Mr. Cussons, of Southport, must have got some *Canary tissue paper* to make his trial on, as he says that he used *two* thicknesses of the medium and got nothing but veiling.

Now there is one question I should like to ask: Whether or not the members of the West Riding of Yorkshire Photographic Society are able to judge the difference between the two lights; but seeing that they have unanimously adopted the *real medium* (and not the tissue paper that our friend Mr. Cussons seems to have used), shows pretty plainly that they are capable of judging for themselves, and, as I have said before, they are unanimously in favour of *Canary medium.*

Besides the West Riding of Yorkshire there is Gloucester, and other places, where the ruby is entirely "snuffed out," from the fact of having once seen the *real canary medium* in use; in fact, Mr. Gillard, of Gloucester, is so much in favour of it, that he has a five-feet window covered with nothing else, and it is only *one thickness*, so I think Mr. Cussons has made a great mistake somewhere, when a man of Mr. Gillard's standing can work under the medium, and with perfect safety, too.

Now, as to the test before the above-mentioned Society. My lamp was fixed up in the room by the side of the ruby, it being only covered with *one* thickness of the medium on plain glass, and a sixteen-candle gas-burner inside the lamp turned full on, the ruby lamp having a small taper burning inside. Trials were then made by the members, a double quarter-plate negative being cut in two, also another unexposed one, and being placed on the negative, and put in separate printing-frames. They were exposed to the respective lights for three minutes, when, being developed, the ruby gave a strong transparency, and the canary a slight impression. Now, taking into consideration the canary having a sixteen-candle burner, and the ruby only a small taper, and the result being as above stated, surely the members are justified in discarding the ruby; and I, as a member, cannot see why Mr. Cussons should be so positive, and give a direct negative to the canary without first knowing whether he had got the right medium or not. Several other plates were developed during the evening, without the slightest trace of veiling. So I say once more, surely some of the members, who are old-standing photographers, would have seen whether the light was trustworthy or not.

It also seems to me that Mr. Cussons is the only maker of a *rapid dry plate*, as he says he developed one of his *extra rapid dry plates* by a gas lamp covered with two thicknesses of the medium with the result of veiling. Now, I have no doubt that mine and other makers' plates would have veiled under the same medium used by our friend; but as a plain proof to him I may say that I have seen *his*, and most other makers', of the extra rapid plates, which he refers to, developed under my medium without the slightest trace of veiling.

I send you with this a sample of the medium, so you can test for yourself.—Apologizing for trespassing on your space, I am, sir, yours respectfully,

72, *Barkerend Road, Bradford.* THOS CHAS. BRIDGES.

Proceedings of Societies.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE Annual General Meeting for the election of Office-bearer for the ensuing year was held in the Religious Institution Rooms on the 29th ult., when the following gentlemen were duly elected, viz.—

President—Mr. John Urie.

Vice-Presidents—Councillor Robertson and Mr. Paton.

Treasurer—Mr. George Bell.

Members of Council—Dr. Fairlie, Messrs. Stirling, Morran, Skinner, Reid, and Gilfillan.

Honorary Auditors—Messrs. John Parker and A. McTear.

Secretary—W. Craig Ramsey Writer, 134, St. Vincent Street.

A committee was formed for the purpose of getting a print for presentation to the members of the Association.

The attention of the meeting was drawn to the fact that a number of the members had not got copies of the Rules of the Association, and that prints of the same were exhausted. A committee was appointed to revise the rules and print the same.

The Council were empowered to take the necessary measures to get up an excursion among the members to some picturesque locality for the purpose of giving professionals and amateurs an opportunity of competing in landscape photography.

A vote of thanks was awarded to the late Secretary, Mr. McGhie, for his services to the Association.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting was held at the Museum, Queen's Road, as usual, on Wednesday, Mr. RADCLIFFE in the chair.

The minutes of the last meeting having been confirmed, the Rev. Joseph Strutt Bird, of Wilts, and Major Graham Owen, of Bath, were elected ordinary members of the Association.

The Hon. SECRETARY then communicated to the members an invitation to them to spend a day (to be fixed) at Great Elm, near Frome, and to lunch at the residence of the Rev. H. B. Hare (one of the members), from whom the invitation came.

Rev. H. B. HARE said that he desired that it should be an extra meeting beyond the ordinary excursion meetings, and he was sure they would all be pleased with the subjects for the camera which the neighbourhood presented.

The Hon. SECRETARY said he had had the pleasure of spending a day with Mr. Hare at Great Elm, and he could quite confirm his statement as to the beauty of the district, having had excellent opportunity of judging, the weather experienced on that day having been of almost every kind. It simply remained to fix the date. After some discussion, the 26th inst. was decided upon, and

The CHAIRMAN, having ascertained that that date was agreeable to Mr. Hare, thanked him on behalf of all the gentlemen he had so kindly invited, and said that if able to be present and the weather were fine, he quite looked forward to a very enjoyable day.

The Hon. SECRETARY having read a letter from Mr. H. N. White, of the Isle of Wight, who was to have read a paper on Vitro-enamels, stating the great regret he felt at being quite prevented (through the serious illness of a relation) from delivering his paper in person, stated that there was no other business to transact.

The CHAIRMAN then asked the Hon. Secretary to read the paper which Mr. White had forwarded, entitled "Vitro-enamels" (see page 242) at the close of which

Mr. BIGGS said that never having directed his attention to this branch of the art-science, he was much surprised at the beauty of the productions, and had experienced very great pleasure in listening to the paper treating thereon, and equally pleased by the large number of charming portraits and landscapes Mr. White had been at the great trouble of sending. The process might be applied to so many purposes that he much wondered how it was so very few professionals at all worked it; he considered

it a great loss that the writer of the paper was not present to give fuller details of the process, and asked the Chairman if he could say from experience whether it was tolerably simple as to apparatus and formulæ.

The Chairman said the "dusting-on" process was not difficult, and might be easily understood from the Almanac; the time of "fixing" often did not exceed a few minutes.

Mr. Biggs said that Mr. White was hardly quite correct, he considered, in his idea as to the old five-shilling pieces; gold, he knew, was often used in colours on china work, as a friend of his had frequently seen old guineas poured into the preparation being used in that trade.

The Chairman remarked that all the salts of silver must produce either a yellow or orange colour, and that a great deal of darkroom glass was coloured by these means.

Mr. Biggs remarked that the almost sole use of uranium is for forming the uranium colours for porcelain printing.

The Chairman noted that Mr. White did not mention iridium in his paper, but he presumed he used it.

Mr. Powell asked if it was possible to print on a curved porcelain "plaque," to which—

The Chairman replied that Oberuetter had frequently done so; as to the fluxes, he thought the chief was probably lead, with a silicate.

Mr. Daniel felt certain that, although he had been obliged to act as a very poor substitute for Mr. White, still all must have greatly enjoyed the paper and the sight of the large quantity of specimens; nevertheless, he feared that few of the members, except those not engaged in business, would know how to find time to add that most pleasing section of photography to their labours, if they did much to ordinary paper print work.

The Hon. Secretary stated that that was the last ordinary indoor meeting for the session, and hoped that the out-door meeting would be well attended.

A cordial vote of thanks to Mr. White for his most instructive and interesting paper closed the proceedings.

Dundee and East of Scotland Photographic Association.

This Association held their first annual out-door meeting on Thursday, May 6th, at Glamis Castle. The party left the post office at 9 a.m., fully equipped with photographic apparatus, every one eager to secure the beauties of nature. After leaving the smoke and sulphurous vapours of Dundee behind, the party made rapid progress towards Glamis. Passing through some charming scenery (notably Lumley Den, a wild, rugged ravine, with precipitous rocks on each side of the road), here a halt was made that all might enjoy the magnificent view. On arriving at the Castle gate here the antiquarian would find food congenial to his soul in the richly-sculptured doors and armorial bearing of the ancient and historical Castle. Here a large photograph was taken by Mr. Robertson before leaving the brakes.

Through the kindness of the Earl of Strathmore, the ladies and younger members were shown through the Castle and grounds; the historical and ancestral portraits adorning the walls and the beautiful specimens of tapestry combined with the rare and antique furniture, were much admired.

In the meantime, amateurs and professionals shouldered their instruments and set out for some lovely and romantic glen, when views were taken successfully of the various falls, &c.

After reassembling, the party, consisting of about forty, sat down in picnic fashion to a splendid collation supplied by Mr. Rodney.

In the absence of the President (Mr. J. C. Cox), Mr. J. Robertson (Vice-President) presided, while Mr. G. F. Roger acted as croupier. The following toasts were then given:—By the Chairman, "The Queen, the Prince of Wales, and members of the Royal Family." "The Photo. Art," by the Chairman; reply, Mr. Johnston. "The Amateur Members," Mr. Donald; reply, Mr. Jaffrey. "The Association," Mr. Roger; reply, Mr. Tannahill. "The Town and Trade of Dundee," Mr. Jaffrey. "The Strangers;" reply Mr. Easson. "The Ladies," Mr. Urie; reply, Mr. Fraser. "The Earl of Strathmore," Mr. Robertson; reply, Mr. Roger.

After dinner, the party was again photographed in front of the Castle, by Mr. Roger, Broughty Ferry.

After spending a most enjoyable day, the party arrived in Dundee highly delighted with their day's outing.

To Correspondents.

*** Pressure on our columns compels us to postpone Mr. Bradford's "Topic."

A. Printer.—Of course they are of value. You may put them with the waste hypo-sulphite solutions and treat with sulphuric acid and sulphide of potassium; or, better still, add a solution of sulphate of iron, collecting the grey precipitate for treatment in a crucible.

J. P.—There is no difficulty about getting the collodion film to leave a glass plate. If you apply a little talc to the glass surface prior to collodionising, matters are at once facilitated. Soaking the negative in acidulated water will further assist the operation. While still moist pour a solution of gelatine over the film and then press a sheet of sized paper upon the collodion. On drying, the collodion will peel off on the paper. To re-transfer to zinc, coat this with varnish and put on it the collodion paper face downwards; immerse in warm water, and the gelatine will dissolve, leaving the film on the zinc. With care, you need not use varnish.

P.—Would be glad to know where he can purchase cloud negatives.

Adolph Ott.—We will write shortly.

R. L.—With a rapid gelatine plate either of the lenses should give you such a picture as you desire with a drop shutter; but probably an exposure of a full second or so would be more favourable towards giving all that harmony and detail you desire to secure.

T. C.—The yellow deposit you allude to is ferrous oxalate, which means there is an excess of iron in your developer. You should have no difficulty in getting the *neutral* oxalate of potash, which dissolves readily in the proportion we have given. Have you taken oxalate of iron by mistake?

E. Kesterton.—The book is now published. The number of the News for April 30th contains a very good formula; our publishers will send it you on the receipt of four stamps.

Wirksworth Artiste.—Next week.

C. J. Harlie.—Thank you for note and sketch.

D. Whyte.—If he has not started already for Russia, we will see him on the subject of your note.

W. H. Deslandes.—Thank you; we had not seen it. We will make use of it in "Talk in the Studio."

Oxalate.—The print you send is exceedingly good; and we see no line of the sky shade. Mr. England, who employs the shade, does not find any difficulty in respect to intensity. Should it occur, which we doubt, we would recommend no clamping, but a slight movement during exposure. You could not improve much upon the picture you send.

Williams.—Very glad to hear of your success; you may use the developer a second time if you like. Also you may develop like a wet plate, only the operation requires some skill. You will see that we repeat the proportions in this column.

Amateur.—You will see we have inserted your question in another column.

George Molde.—Thank you; we will write.

Oxalate Developer.—We repeat Eder's formula:—

Solution A.

Neutral oxalate of potash	4,030 grains
Water	35 fluid ounces

Solution B.

Sulphate of iron	1,550 grains
Water	11 fluid ounces
Sulphuric acid	2 to 4 drops

The two solutions, A and B, are kept in stock, and mixed in the proportion of three volumes of A to one of B for developing.

W. L.—We will look up the paper for you, and let you know next week.

Subscriber.—Cotton wool bought at a draper's frequently contains gum; hence, probably, your difficulty; buy of a chemist. Remedy: give the bath plenty of daylight, and filter, and add a little acid as directed in article.

Thomas Forrest.—We have had little difficulty in controlling, by watching the result, and shortening or lengthening the period of time in the developing bath. But we have referred your letter to Dr. Eder himself, who will probably discuss the matter in a special article.

H. B.—Thank you.

Enamel.—The cause of cracking was either due to there being no film of collodion upon the gelatine, or this was too dry when pressed up. In a very dry state the gelatine inevitably cracks. Most enamellers advocate mounting while the print adheres to the glass. You are right in mounting about half dry. Put a drop of castor oil into your collodion (not enough to prevent it drying), and this will give you a tougher film and one less liable to crack. At the same time your surface is very good, when not pressed up. We shall shortly have something to say on this subject, having just returned from Paris.

Ada Brown.—The sandy deposit you describe is generally the result of too much iodide of silver. Dilute and filter your bath, and see if the evil be not removed.

The Photographic News, May 28, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photographic "Technical" Meetings—Print-Washing Machines—Photographing by Phosphorescence—Post Mortems.

Photographic "Technical" Meetings.—"Technical" meetings of societies, while occasionally difficult to report, and therefore to those not present apparently bald and uninteresting, are generally of great importance, and should be encouraged. The "technical" meetings of the South London Photographic Society are always looked forward to by the members, and are rarely, if ever, disappointing. Apparatus upon which a man has spent much time, and which perhaps he regards as perfection, is sometimes, when put in competition with others, found not to be quite so perfect as the inventor fondly imagined; and though it must be somewhat galling to discover that you have thrown money and time away, yet there may be some consolation in pointing out some defect even in the apparatus which has distanced your own. On the other hand, weak points which have been overlooked may be remedied by some one coming fresh to the invention and examining it for the first time. It is obvious that "technical" meetings cannot be conducted in exactly the same manner as those where papers are read. Without a practical examination of any new form of apparatus it is sometimes difficult to understand its working, and therefore almost impossible to discuss its merits. For this reason it would be almost better on such occasions as at the last meeting of the Photographic Society, when a number of instantaneous shutters were shown, if half an hour before the meeting was devoted to a practical examination of the various inventions by the members, so that they would come to the discussion of the subject with a full knowledge of the relative advantages and disadvantages of the various apparatus. It so happened, fortunately, that on the occasion referred to, this end was in effect gained, the discussion being adjourned.

Print-Washing Machines.—While on the subject of technicalities, might we suggest whether it would not be advantageous if a practical demonstration of the various print-washing machines could take place? There is certainly a difficulty in the way with regard to the water supply, and we doubt whether the proprietors of the Gallery in Pall Mall would care to lay on the water specially for the purpose, though it is possible, if the night were a moonlight one, the fountains in Trafalgar Square, close handy, might be utilised. We cannot, however, realise the picture of the respected president seated in state on one of the lions while the rival machinists performed. We are inclined to think that the entire spectacle would be too much for the ubiquitous London boy, who would be bound to lend his assistance. Reluctantly, therefore, we abandon the notion of a practical demonstration. But theoretically, and in a dry state, why should not some kind of competition take place? A washing machine is, it is true, a little more cumbrous than an instantaneous shutter, but this drawback could surely be overcome. Seriously speaking, the subject of the best and most complete method of washing silver prints is a most important one, and none the less so because it has occupied the attention of the photographer since the very earliest days of the art. Nearly every man has his own pet notion as to the best method. Those who like to take matters easy use the machine, trusting to the manufacturer's word that it is efficacious; others swear by the old method of hand labour; one believes in running water, and soaking all night long; a second declare this is ruination, and will only hold that a print is perfectly washed when the washing can be completed with as many changes as can be crammed into half an hour. For ourselves, we are not disposed to believe certainly in the trustworthiness of any particular washing machine. The self-acting apparatus which necessitates long washing is certainly not to be recommended, as the paper is likely to be decomposed by the constant saturation, and organic change set up, especially if the pictures adhere together at all. On the other hand, a machine which is designed to wash a print rapidly may do it at the expense of breaking up the fibre of the paper, and thus bring about a similar result. Hand labour, however, in a large establishment is almost impossible, and machines, we fear, are a necessity.

Photographing by Phosphorescence.—The simultaneous experiments of Mr. Warnerke, Lieut. Darwin, and Mr. W. Bedford in regard to the production of negative and transparencies by means of the light transmitted from a luminous surface, such as Balmain's phorphorescent paint, furnish a curious example of unconscious coincident working, each gentleman being unaware that the others were experimenting in a similar direction. Perhaps we shall soon hear of someone else who has also hit upon the same idea. We believe the results of Mr. Warnerke's experiments were recorded in a packet which he sealed and gave into the keeping of the President of the Photographic Society, with the request that the packet should be kept until asked for. The object of the request was that, as Mr. Warnerke was about to proceed to Russia, he was anxious to place on record the exact date when he made the experiments referred to. Of course neither the President nor the Council knew what the packet contained, and no doubt the circumstance caused some little speculation. Whether guesses were hazarded that Mr. Warnerke, whose fertility of invention appears to be inexhaustible, had at last solved the problem of photographs in natural colours, or had discovered the process of transmitting a portrait from Cheapside to Chicago, and so cut out half-a-dozen or more rival inventors, we are unable to say; but certain it is they were not kept long in suspense, for shortly after Mr. Warnerke had obtained the President's promise of inviolability he again waited on the Council and asked, in fulfilment of the engagement, that the packed should be delivered. The fact was the mysterious packet contained, as we have, said the records of the experiments with a phosphorescent surface. Mr. Warnerke, when he heard what Lieut. Darwin and Mr. W. Bedford had been doing, had no alternative but to make the contents public. And thus what might have been made into a pretty little romance of science was spoiled. Still Mr. Warnerke has reason to be thankful even for small mercies. Had Lieut. Darwin and Mr. Bedford kept their secrets until after Mr. Warnerke's departure from this country it would have been still more annoying.

Post Mortem Photographs.—"Post Mortems," as they are technically called, are about the most disagreeable things which a photographer can be called upon to perform. The ordinary professional engagement of this kind, unpleasant enough as it is, is nothing compared to the terrible task of photographing human remains for identification. What dreams of "horrid shapes and sights unholy" must the operators who went through the horrors of photographing the unhappy victims of the Princess Alice disaster have had, were they at all nervous or imaginative! The official whose ghastly office it is to photograph the swollen and disfigured bodies which form so repulsive an exhibition at the Morgue must have nerves of iron, or in the gloomy recesses of the dark room he could not go on day after day developing hideous pictures, any one of which is enough to "appal the guilty and make mad the free." In Paris, the authorities seem to carry the practice of photographing dead people to an almost unnecessary extent. A poor little child who was brutally murdered and mutilated some short time since was photographed, though there was no doubt as to identity. In the case of the most recent of the numberless Thames mysteries, the discovery of the mutilated remains of a boy at Battersea, there is ample justification, since the identification of the body may lead to the discovery of the murderer. Even such an undertaking as this must be a gruesome office, and we hope that the photographers who have sufficient self-control to execute this and similar tasks are well paid.

At Home.

THE ORDNANCE SURVEY DEPARTMENT, SOUTHAMPTON.

There is always a peculiar charm in visiting a military establishment. Discipline and order manifest themselves in a hundred different ways, and in matters of science prove of the utmost value. This, we should say, is certainly the case at the vast photographic and engraving department at Southampton, over which Colonel Cooke, C.B., so ably presides, with Lieut.-Colonel Scott, R.E., as his executive officer. The work here attains a high standard of excellence, and through every detail of a somewhat elaborate process, care and intelligence are at once apparent. The practice of zincography is here seen at its best, and that best is certainly deserving of the highest praise.

The buildings at Southampton occupy a space of something like seven acres. Here are produced in zincography and in copper-plate engraving those marvels of accuracy, the Ordnance maps, in the production of which an amount of labour and care is bestowed little imagined by the parish officials to whom they are of such service. The Ordnance survey of Great Britain has been going on for many years; indeed, it is one of those things which may be said to have no end, for though hills cannot sink to plains, nor valleys rise to mountains, yet the boundaries of towns are constantly changing, and the survey of London ten years ago would present a very different appearance from what it does now. Towns of over four thousand inhabitants are honoured by a map on a scale of vast magnitude, no less than ten feet, or, to speak correctly, 10·56 feet to a mile, one square foot of map thus representing 500 feet of ground. Ordnance maps of cultivated country are drawn to a scale of 25·344 inches to a mile, or one square foot to 2,500 feet. There is a third series of six inches to a mile, or one foot to 105,600 feet, and a fourth of one inch to a mile; the latter series being of two kinds, one in which the hills are represented in relief, and the other in which outlines alone are drawn. These four series represent the maps which are the basis of nearly all the maps of Great Britain now published. Specimens of each—Brobdingnagian examples of zincography and engraving—are shown on the walls of the library of the Southampton establishment, and though they consist of sections of 38 inches by 25 joined together, so perfectly has the work been performed that, save in blank spaces where there is no detail, the joins are imperceptible.

Let us suppose that the careful and painstaking Sapper has made his survey, and has executed his drawing. The drawing is sent to Southampton, photographed, and sent to the central office to be examined for corrections; any alterations—and they are, as a rule, very few—being made on the photograph. When the latter is certified as correct, a tracing is made on starched paper in lithographic ink, and then transferred to zinc. This, so far as the large or general scale of ten and a-half feet to a mile is concerned; with the reductions a different plan is pursued. By the kindness of Colonel Scott we were enabled to trace the progress of a reduction from its starting point to its completion, and very interesting were the various stages.

With experienced Quartermaster McDonald as our cicerone, we first visit the studio. The latter was built by Sir Henry James, and is cruciform in design, its nave and transept, with their circular roof, suggesting a Crystal Palace in miniature. Very pretty to look at is the studio, but not altogether what would be built now-a-days. The management of the blinds requires a little skill, while the studio, being raised some twelve feet above the ground (the lower portion being devoted to printing rooms) instead of on the basement, vigilance is needed to avoid vibration from footsteps. By an ingenious arrangement, which permits the drawing to be copied, being shifted easily, so as to obtain a perfectly parallel plane with the lens, a section is suspended ready for copying. "We use direct sunlight when we can get it," says Quartermaster McDonald, "as we get a short exposure and less reproduction of the inequalities of the paper." The camera, a goodly sized instrument, unpolished and homely looking, is mounted on a massive stand, the legs of which slide in a metal tramway. The legs are without wheels, and for an obvious reason. When the true position of the stand has been ascertained, there it remains without fear of disturbance until the time when it is necessary to move it. The lens is a doublet well stopped down. While we are in the studio a negative is taken. The ordinary wet process is worked, Hardwich's collodion being used in preference, owing to its toughness, a valuable quality in the intensifying method adopted. The negative is brought out of the dark room and placed in a saturated solution of bichloride of mercury until bleached. It is then removed into the open air—a gallery running round the studio enables this to be done readily—treated with sulphide of ammonium—which, by the way, is never allowed to get stale—and well washed. The result is a negative of a deep brown colour, with clear sparkling shadows capable of producing perfect blacks and whites.

So much for the negative. The print is the next step. The sensitizing material is bichromate of potash and gelatine, on unsized bank-post paper—the proportions being bichromate, 3 ounces; gelatine, 2 ounces; and water, 40 ounces. The exposure is short, apparently about three minutes in diffused daylight, no actinometer being used. When taken from the printing frame the image is visible of a pale, rather dingy, yellow colour. The print is now placed face downward on a plate covered with a greasy ink and passed through a press. Placed in hot water, the latter dissolves all the bichromated gelatine not acted upon by the light, and the superfluous ink is removed by three or four applications of a soft sponge, leaving the image clearly and sharply defined.

The next process is the transfer to zinc. We accompany the Quartermaster to another building where the zincographers are busily at work. Here is a lithographic press, the bed of which is formed of zinc, carefully scraped, and a "biting" surface prepared with a fine sand, the grains of which are so small they pass through a sieve of 160 holes to a lineal inch. The plate is damped, and the print, also damped, laid face downward upon it, and passed under the roller. The metal, greedy of oil, and as repellent of water as the back of a duck, receives on its surface a facsimile of the print. The etching solution, consisting of gum-arabic, phosphoric acid, and a solution of nut-galls, is washed over the plate, and bites into those portions not protected by the greasy ink. A little "dodge" adopted here is worth noticing, inasmuch as it shows the attention which the workers pay to detail. Directly the etching solution is poured over the plate the zincographer and his assistant begin fanning the zinc vigorously with parchment fans, with the object of hastening the action of the acid, and so being able to use a weaker solution than would otherwise be necessary. An application of turpentine removes all the superfluous ink, and the zincograph is complete. In taking the impressions only one precaution is necessary—the plate must be damped. Were this not done, the ink would flow over the plate instead of being retained only on the zincograph. For the reproduction of drawings and engravings in lines nothing can be more admirable than the zincograph; in the reproduction of a tone it totally fails. Prints from a landscape negative were shown us as examples of what the process could do, or, to speak correctly, could not do in this direction, and the results were certainly not encouraging.

In addition to the zincography carried on at Southampton, there is, as we have already mentioned, an extensive establishment for copper-plate engraving. Here copper-

plate engraving is to be seen in all its stages. In one room are half-a-dozen engravers sprawling—the attitude of the copper-plate engraver is a peculiar one; while the wood engraver invariably sits to his work, the graver on copper stands, or rather sprawls, over a high desk—each in front of a window, the light of which is softened by a screen of tracing paper, labouring and patiently cutting every line which he has previously traced on the bright sheet of copper before him. In another room the chief work consists of the putting in of trees and houses. The houses are manufactured by a series of parallel lines, ruled by a ruling machine capable of cutting 90 lines in an inch, while trees are planted and arrive at maturity simultaneously, merely by a tap with an ingeniously constructed little instrument. The most important part of the process is, of course, the electrotyping by which the copper plates are reproduced, and the rapidity of production of prints increased to any extent. The introduction of electrotyping into the Government establishments was due to that economist of economists, Joseph Hume, and the effect was to bring down the price of the finished prints from 8s. to 2s. There is something uncanny and ghostly in the electrotyping room. It is a gloomy apartment, with wooden troughs at each end perpetually oscillating, to ensure an even precipitation of copper, in a monotonous sing-song fashion, the motive power being supplied by an apparatus in the centre of the room, partaking in appearance of the characteristics of a mangle, a lathe, and a roasting jack. The principle by which it is worked is indeed that of the last-named useful culinary instrument, and after having been wound up it keeps the troughs moving to and fro by a very simple mechanical arrangement. The first object of the electrotyper is to obtain a matrix—an impression in which the depressions and elevations of the original are reversed. When a matrix is once obtained it is evident any number of plates similar to the original can be produced. In these troughs both impressions from matrices and matrices from original plates are being manufactured from the continual deposit of copper. At intervals the plates, which are connected together with a wooden arrangement, are weighed to ascertain the amount of copper deposited, and when examined, taken out and "stripped," that is, the two plates are separated. This is a very interesting operation, and it is really worth a journey to Southampton to see the deposited copper transformed into a shining plate, the exact replica of the one which has taken so much time and labour to produce.

It should be mentioned that besides the ordinary work of the Ordnance survey, the department has other and perhaps more delicate employment. The copying of old documents and State records forms a very important branch, and here zincography comes in exceedingly useful. The copying of the Domesday Book is an example of Ordnance work admirably performed, and every day some priceless relic of the olden times is being perpetuated and brought within the reach of the antiquarian of modest purse.

Mr. Saunders, the librarian at the Southampton establishment, is the amiable custodian of all manner of parchments more or less valuable and more or less ancient. The term "musty" certainly did not apply to those which it was our good fortune to see on the occasion of our visit. Documents of the time of Canute, William the Conqueror, the original charter of Westminster Abbey, granted by Edward the Confessor, the will of Ethelred Athelstane, were only a few of the curiosities which have been sent to Mr. Saunders to be copied, and the sight of which would send a Dr. Dryasdust into exstacies. The writing of many of these old parchments, eight and nine hundred years old, was but little changed, and gave one an excellent impression of the skill of the inkmakers of those days. Triumphs of the zincographic art were the reproductions in colours of some ancient Irish records, in which half-a-dozen colours have been successfully imitated, to say nothing of the tint and stains of the parchment. Mr. Saunders' pride in these was amply justified, for certainly in point of accuracy those produced by hand, and lithographed at a great expense, would not compare with them.

One other feature we have to mention, and we have done. The storing of the original drawings of the Ordnance Survey, and of the copper plates, is conducted on a system by which the caretaker can turn at once to any drawing or plate he wants. The rooms are fireproof, and you walk through avenue after avenue filled with shelves reaching from floor to ceiling, until you become thoroughly convinced that in accomplishing such a Herculean task as the survey of England and Scotland, the Sapper has truly been "monarch of all he surveyed."

The "At Home" for next week will be "The Maison Lejeune in the Rue St. Honoré."

ON THE PYRAMIDAL FORM OF COMPOSITION IN PICTORIAL WORKS.

BY EDWIN COCKING.*

I WILL now draw upon the black board examples illustrative of the subject, and endeavour to show how the various designs are evolved and gradually built up to completion. The illustrations are of such a nature that they could all have been produced through the agency of photography, and, therefore, will repay attention and study.

The following examples were then rapidly sketched on the blackboard, and each production secured a round of applause:—

No. 1. A German chromo-lithograph. A faithful dog and a sleeping boy are the figures.—Here the dog becomes the principal point of the apex, and commands attention. Notice how all the lines of the picture lead up and take the sight always to the principal figure.

No. 2 is taken from the lid of a French *bon-bon* box, being a chromo-lithograph.—Here two children are so placed as to convey the pyramidal form. One of the two heads forms the apex, and the back of one and the side of the other child form the sloping sides; but in this subject another design is introduced, also on the same principle, being two fowls, which are so placed as to suggest the pyramidal form. Then notice how all the other lines in the picture are subsidiary to the principal figures. A door on one side has cross-pieces, whose lines point to the central object; also, on the other side, a beam of wood on the wall is made to carry the eye towards the children.

No. 3. "The Virgin and Child." By Giovanni Bellini.—Here the head of the virgin forms the apex of the pyramidal form. The child on one side and the folds of drapery on the other carry the lines down to a base. A curious way of introducing perpendicular lines has here been used by suspending behind the figures a kind of mat, which also helps to break up the colours of the picture.

No. 4. Another German chromo-lithograph, but a very pretty picture, where a boy and girl are having roast chestnuts.—Here the sides of the pyramidal form are made by the graceful bending of the figures. Notice how the slanting lines are repeated in the legs of the chestnut can, as also the perpendicular lines in the background.

No. 5. "The First Tooth." By Edward Hughes.—This is a serial design from *Good Words*. A mother with a child on her knee leans forward, making one slanting side; the grandmother on the other side also naturally leans forward to see, and completes the pyramidal form. Notice how similar the arms of the two women are in position. This suggests sympathy.

No. 6. Wood engraving in the *Graphic*. From a painting by J. Hook, R.A.—Here again we have a specimen of double pyramidal form in one picture—sailors, and family on a flight of steps by the sea. Notice how the slanting of the steps, which must have been a fact in nature, has been counterbalanced by the lines of a ship's mast, introduced solely for the purpose of balancing the composition.

No. 7. Design by H. Selous, in *Pilgrim's Progress*, where "Christian is armed by Prudence, Charity, and others."—Here the apex is used for the principal figure, whose helmet makes the highest point in the design. The two females on either side carry out the slanting lines, whilst base lines are intro-

* Continued from page 244.

duced by means of some stone steps, which serve to raise the principal figure, and so help the design.

No. 8. "Our Cook Room" is another scene from life in India.—Here, as in the other design, the artist has availed himself of the natural positions of the natives to assist in the composition of the picture. Of course, in these two examples you have rules pushed to their extreme; but what should be noticed is how yielding these rules are. They can be used, as in these instances, to produce mirth from their comical adaptation, or, as in the examples from Bellini and Selous, they produce dignity and repose.

No. 9. "Curry and Rice." Life in India. By Captain Atkinson, R.E., the work of an amateur.—The subject is a lady being fitted by native dressmakers, the lady being the central object. Her head forms the apex, and the sides of the pyramidal form are made by placing workmen squatting on the ground, and who also carry out the base line. Here again perpendicular lines are introduced in two columns, being the verandah of a bungalow.

VITRO-ENAMELS.

BY H. N. WHITE.*

In 1865 a patent was taken out by Alfred Grainger, of Kennington, and Charles Girdler, of Walworth Road, London, for improvements in the production of portraits or likenesses on ceramic ware to be glazed and burnt. In this the ware was first glazed and fired, and the portrait then applied, fluxed, and fired again with borax or other suitable flux.

I cannot tell whether these gentlemen succeeded in their design, but I do know that all this fluxing would be very dangerous to the vitreous colours that are made for the "regular kiln;" for every colour is properly adjusted with flux before it leaves the maker's hands, and to increase this would have the effect of firing off and quite spoiling its beauty and glaze. Hard kiln colours may be used, but to bring out their proper lustre the operator must be very careful indeed as to the amount of flux he may use. Borax is a *very* soft and, I may say, *bad* flux, and if used in any quantity will effloresce, leaving the image anything but indelible. Nor is borax suitable for all colours, as it causes them to "run."

In 1866 Wilhelme Grune patented a process in which the *negative*, after being fixed and washed, was coloured in black with chloride of platinum, then dried, covered with a "glassy flux," and annealed in a common muffle. This negative was then covered with a thick iodised collodion on the same side as the picture, put into the silver bath, and then disposed in a frame in such a manner that the uncovered side or back of the negative was directed outwards, the collodion side being secured from light. The image was printed by either day or artificial light, and the plate afterwards developed by means of a solution of sulphate of iron and sulphuric acid, fixed with hypo., and well washed. Before it was dry the film was loosened by scratching with a pin all round the edge, and immersed in glycerine and water, when the film separated and floated from the plate. The film was afterwards treated with chloride of gold, platinum, or other metallic salts, iron, copper, manganese, uranium, chromium, &c. After well washing the film was floated in a syrup of sugar and water applied to the tablet, and was then ready for the kiln. All this is very troublesome work.

In 1867 a patent for improvement in producing opaline pictures *into* china, glass, porcelain, or other enamelled surface was taken out by Mr. George Higginson, of Preston, Lancashire. The chemicals required were salts of uranium, pyrogallic, gallic, nitric, and citric acids, cyanide, silver, iron, and zinc. These, of course, will not stand the heat of a kiln. The specification stated that they were fixed in so permanent a manner as not to be removed without scouring with emery or some such cutting agent, and they were not injured by light or atmosphere in any degree. This invention, however, received provisional protection only.

In 1873 Messrs. Jonathan Edwin Billups and Edwin Palmer Lee patented a process for producing designs on porcelain or other ware, which was performed with a brush or other convenient means on the ware, using vitrifiable colours and fixing the same.

I think we need not dive further into these and other patents, which, for aught I know, may still be in existence, and dangerous in a legal sense for an amateur to touch. Those wishing to try their hands in this direction need simply consult the various almanacs or photographic journals, where they may find processes so plain that "he who runs may read." These, with the skill and improvements of a studious operator, will furnish him with a groundwork wherewith he may produce some of the choicest works for staining glass and the decoration of pottery. The exercise of "experience and study," or of "patience and perseverance," is, of course, a *sine qua non*; there is no royal road to anything, and he who is down-hearted at his first failure is hardly likely to succeed.

The kilns for fixing should be constructed on the closed principle, and not built too high. My first was faulty in this respect and gave me much trouble, the temperatures of the top, middle, and bottom, being all different. Where, however, "hard kiln" and "soft kiln" colours are both used, this would prove an advantage. Should an open furnace be used, before inserting your specimen see that the flame has ceased to play around the box or muffle, and that the fire has just passed its height and commencing to decline, or what might be a really good picture may come out completely spoilt. Enamels upon copper, glass, pot opal, or flashed opal may be fired in an open furnace almost with impunity. Porcelain *plaques* will be sure to split—explode, in fact.

Upon taking out your tablets have tin covers made to put over them, that they may anneal gradually. They may be piled one upon the other as they are taken out, which will effect a more gradual and better cooling than if placed side by side. Gas furnaces I think I need not touch upon. Except for very small enamels on copper they are next to useless.

The process being now so easy of accomplishment, the questions arise—Why are there not more workers in this field? What are professionals doing? We know the latter complain much of the badness of the times, and would be glad of something fresh as a stimulus to bring in small, if not large, fortunes. With respect to the enamels hitherto introduced, the prices are so great that families even with good incomes are very little tempted to indulge in the expensive luxury. But the public is beginning to ask for vitrified portraits, and to my surprise I observe that many of the first-class dealers in porcelain ware are beginning to supply them instead of photographers, whose real business it is. These tradesmen can supply, if a *carte* or cabinet print be sent, a copy almost as good as can be produced from the negative itself, and at very reasonable prices. However, upon this side of the question perhaps you are not much interested. China painting, now so much the rage, might be combined with photography, thus helping in a fresh way to develop that art industry, and giving employment, perhaps, to thousands.

Does any one say—"Well; after all, what is the use of going to the trouble of vitrifying your photographs, and to what purposes may they be applied?" "Well;" I reply, "if there is a necessity at all to have portraits of our loved ones, it is equally necessary that they should be permanent." Every one of us is glad to know what our own grandmothers and great grandfathers were like, and in what "odd" style to us were they dressed. Very few in the present age have the good fortune to possess these mementoes. A portrait in oil was expensive. Equally expensive were the water colours upon ivory, and a generation or two back there were not enough artists for the million.

A few years back a firm of some standing in London charged me two and a-half guineas for a slightly-tinted vignette portrait, being one guinea for the negative and one copy, and one guinea and a-half for the painting. The picture is getting yellow now and fading—very poor satisfaction for my 52s. 6d. Just now (April 16-17) the daily journals give an account of an action, Valentine *v.* Ablet, for the recovery of £7 odd, the value of photographs which had faded in a few months. For the defence it was urged that the proofs had not been properly mounted, and that a sea voyage would materially deteriorate the most delicate photograph. The deputy-judge considered that such delicate productions as photographs ought to be properly protected against any influences of "sun" and "salt water," and ruled in favour of the defendant, with costs.

I do not know what you may think of this matter. For my part I will only dare to say that I should be very vexed to spend £7, and an extra £10 perhaps in costs, and still not possess the portraits I had expected.

About three months since a professional gentleman in King's Road, Brighton, showed me two expensive enlargements (somehing like 22 × 18) upon opal, which were by a permanent

* Concluded from page 242.

process; but the pictures were peeling away from the opal ground. The films appeared to be gelatine, and one of them had split in a number of close parallel lines, as clean as if cut with a knife, and then peeled up from the surface of the opal. As the photographer justly remarked, he could not possibly send them out.

Another professional photographer told me that he was obliged to continually touch the specimens in his window finished in water colours—the "sun affected them so." Now, we know that if these things are only fixed by fire they may be buried in the ground for a thousand years and still would turn up as any piece of crockery; and considering that "salt" is an excellent glaze when thrown into the kiln, I cannot see that the salt sea would injure them it immersed in it for the same number of years.

A clergyman of my acquaintance, upon having the foundation stone of his new church laid, deposited within it paper photographs of his wardens, members of his committee, the donors, and one of himself. We can pretty well guess what they would look like even if disinterred after only a few years. This is a case where ceramic photographs would have answered the desired end.

With respect to its applications in addition to portraiture, we might have landscapes upon our walls properly painted over the photographic outline. It is quite as easy to do them five feet square, as one foot. My largest attempts at present are confined to a foot and a-half square. Of those I have brought no examples, the trouble of carriage being great. The process is also well adapted for Minton's thick tiles for the decoration of fireplaces, washstands, Queen Anne and other furniture, toilet services, vases, china ornaments of various descriptions, dessert and dinner services, besides other purposes so numerous that I need not name them. They will suggest themselves to you. I must say, however, that I dislike very much to see portraits upon cups and saucers. It is certainly not the proper place for a portrait any more than the corner of a silk or lawn handkerchief, which was so common a few years since.

I hope that these few remarks may provoke some discussion upon the subject, and that those who have experimented in this direction will say a few words by way of comparing notes; for I take it that the good resulting from these interesting evenings is principally developed by the discussions and questions which follow the reading of the various papers, and should I have set a ball again rolling, I trust it may be kept up to some practical end, and the object of this meeting be obtained by the bringing forth of "some fruit." This I can truly say—that, after having worked at ceramics for so many years, I still find the occupation so fascinating that I sometimes think that were I engaged in it commercially I would prefer to be the working operator to the "master man."

I apologise for the duplicates you will find among the portraits before you, but they are all different in finish. The fact is I have only lately tried my hand at them, and am "hard up" for negatives. Landscapes are my *forte*, and of these I could furnish some thousands, the accumulations of the last twenty-three years.

Before taking my seat I beg sincerely to thank you for the patience with which you have listened to my feeble attempt to interest you. I assure you I feel in this position somewhat like Othello, and am—

"Both rude of speech and week of utterance."

ON A NEW SYSTEM OF PHOTOGRAPHY.

BY L. WARNERKE.*

When experimenting with various phosphorescent substances, it occurred to me to apply it to photography; and the following are the results obtained up to the present moment:—

I prepare a phosphorescent plate, either rigid or flexible, by applying phosphorescent sulphide of calcium, either in the form of paint or powder, to the surface of glass or paper. The coating must be very smooth and uniform. Several substances can be used to cement the powder. Balmain's paint answers fairly well, but I suggest that albumen may be found more suitable, because it forms, when mixed with phosphorescent calcium, a coagulum which protects the phosphorescent material from the destructive action of the atmosphere (carbonic acid and moisture) more effectively than anything else.

A glass may be coated with collodion, and a luminous surface formed on it. The film may be stripped off, and this will be found to be the best process by which to produce a smooth plate. The plate so prepared, and previously kept in the dark, is inserted in the dark slide, and exposed in the camera. After exposure it is removed to the dark room, and put in contact with a sensitive collodion or gelatine dry plate. After suitable exposure by contact, the sensitive plate can be developed, and gives, as the result, a negative with perfect gradation, but reversed.

Theoretically, instantaneous exposure in the camera should be sufficient to give the requisite impression to the phosphorescent surface; and, if this surface could be produced sufficiently fine and smooth, it would be so practically. However, a few seconds' exposure with bright light is sufficient to render the luminous image easily discernible in the dark. There is, besides this, the means of allowing a great range of exposure in the camera; since, if the luminous image is not strong enough, prolonged exposure of the sensitive plate in contact with it will correct the shortcoming. By warming the plate bearing the luminous image the luminosity will instantly be increased, and there will be a corresponding effect on the sensitive plate.

The luminous impression, as shown in my previous paper on actinometers, is persistent, and this allows several negatives to be obtained from one luminous plate. By this means it is observed that contact printing is unsatisfactory for want of, or by too much, exposure; it can be easily remedied without the necessity of giving another exposure in the camera. There is, however, a certain particularity which must be taken into consideration—the luminous image is not sharp. I repeated my experiments in regard to this fifteen times, and I came to the conclusion that the phosphoro-chemical focus is far away from the corrected focus of our lenses.

When once impressed, the plate will remain luminous for many hours, but the luminosity can be extinguished by exposing it again to the light filtered through certain coloured transparent media. Respecting this I may remark that the most suitable extinguishing substance can only be found by actual experiment. I had several sorts of red and ruby glass, and only two of them acted as extinguishers, but required an exposure of ten minutes to the sun's rays. I found a green aniline colour dissolved in collodion or gelatine more serviceable. The exposure of two minutes to diffused daylight was sufficient to complete the extinction. Strangely enough, I have green glass of exactly the same green colour, but it does not act as an extinguisher.

I may mention here, that by exposing the phosphorescent plate behind a negative, a negative luminous image is obtained, which can produce a positive on the collodion sensitive plate put in contact with it, and in this case it will be quite sharp. If the phosphorescent plate be exposed to the light, and then be put in contact with a negative covered with an extinguishing medium and again exposed to the light, the opposite result to that previously described will be observed.

By using a phosphorescent plate it is possible to obtain a photograph of the red end of the spectrum. To do this the plate is exposed entirely to the light; and when the spectrum is projected on it, the rays of low refrangibility will extinguish the excited luminosity of the plate, leaving the lines of the spectrum luminous. This is printed on the gelatine or collodion plate.

The negative passed round for inspection was made under the following conditions:—The phosphorescent plate was exposed in the camera for one minute, using a rapid rectilinear lens. The light was of medium quality. A gelatine plate was put in contact with the luminous image for five minutes.

* These short notes on the New System of Photography were deposited in a sealed envelope, by L. Warnerke, in the hands of the President of the Photographic Society of Great Britain at the Council Meeting of April.

Lectures on Photography.—Mr. W. J. Wilson, F.C.S., Demonstrator of Practical Physics at the Science Schools, South Kensington, has begun a course of lectures at the Birkbeck Institution, every Thursday, on Practical Photography, illustrated by experiments, apparatus, and demonstrations. The first lecture was devoted to a lucid explanation of the nature and properties of light, and of the various forms of lenses which must be combined to make up a portrait or a landscape lens. The succeeding lectures will be devoted to the chemistry of photography; the production of positives, negatives, and ferrotypes, with demonstrations; all the various apparatus required; the preparation of both collodion and gelatine emulsions; and the mode of coating plates, with their development by both the alkaline and the ferrous oxalate developers. Silver printing and platinotype printing will also be explained and demonstrated.

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BALMAIN'S LUMINOUS PAINT.

So much attention has recently been given to the subject of luminous paint by photographers that a chemical and photographic examination of the material will possess for them some interest. In these columns we have already described the actinic power possessed by a body faced with this phosphorescent material, and have also referred to the employment of an "Aladdin's Lamp"—which is simply a glass surface treated with the paint—for illuminating the dark room during the development of gelatine plates. Mr. Warnerke employs the material for his sensitometer, and both he and Lieut. Darwin have recently described methods for making further use of the material in the studio.

Balmain's luminous paint, as it is usually sold, consists of a white powder or sediment in a yellowish liquid. The liquid is for the most part turpentine, and the powder, on analysis, proves to be a mixture of sulphide and sulphate of calcium. We were under the impression that strontium and barium would be present, but no traces of them could be found, and only very small traces of phosphate were to be distinguished. The preparation of the paint or powder, our readers are doubtless aware, is kept a secret, and although it is in the power of chemists to make up phosphorescent compounds, these differ very materially from Balmain's paint. The makers of the paint, curiously enough, deprecate the thinning of it with turpentine, notwithstanding the fact that this medium is largely used in its composition.

To experiment photographically with the paint we chose a series of different surfaces upon which to apply the material. Plates of iron, lead, zinc, copper, and glass were obtained, and each of these coated as equally and smoothly as possible with the material. We did this because some preliminary experiments showed that the intensity of the light varied very considerably and without any apparent cause. Heat and cold were not without influence in heightening and lowering the phosphorescence, as was also the duration of the period that elapsed between the withdrawal of the painted surface from the light and its depiction by means of the camera.

The painted plates were arranged in a row upon a board; their positions could be shifted, so that in one exposure after another, the places they occupied might be changed. Sometimes the board was exposed to the action of bright sunlight, sometimes to diffused light only, and for periods differing from thirty seconds to five minutes. The board was then taken into a dark room, into which no rays of any description penetrated, and set up before a camera that had been placed in position. In this way it was possible to commence the exposure within a few seconds of withdrawing the plates from the light.

At the outset, we may say at once, that whether the luminous paint had been permitted to absorb light for thirty seconds or for five minutes, the photographic result was the same. In each experiment two exposures were given—one immediately after the plates had been withdrawn from the daylight, and the second after a sojourn in the dark room for half-an-hour. An exposure given after the lapse of an hour furnished no result, even with Mr. Edwards' glycerine developer, which, as we have before stated, is most energetic in its action.

The board carried into the dark room, a picture was taken by means of a pair of No. 1 B Dallmeyer's and a gelatine plate. An exposure of ten minutes was allowed, and this sufficed to give a very definite series of images. Development—with the Edwards' glycerine developer, fifteen seconds; with the oxalate developer, made up according to Eder's formula, two minutes. The ordinary ammonia and pyrogallic acid developer gave a very imperfect picture

The result was that the plates coated with the luminous paint appeared in the following order: Iron (light most intense), lead, zinc, glass, copper (light least intense).

The differences observed were but slight, it is true, but they were none the less marked, and on repeating the exposure half-an-hour afterwards, this difference was still perceptible, although the images were weaker in their character. Iron, therefore, faced with luminous paint appears most favourable for use by photographers.

We found that the luminosity of surfaces coated with Balmain's paint decreased very rapidly immediately after withdrawal from the light, but that subsequently the decrease was less rapid. This may be proved by a very simple experiment. Expose a surface to light for the space of thirty seconds, then cover a portion of it up with any opaque body for ten seconds. On turning from the light, the latter part will appear at first quite yellow and non-luminous by comparison: yet after you have kept the surface in the dark room for five minutes, you will not in all probability be able to distinguish one portion of it from another.

One of the great difficulties in the way of employing this phosphorescent material as a means of taking or reproducing photographs has been referred to by Mr. Warnerke and Lieut. Darwin—namely, that of obtaining the material in a sufficiently fine state of division. The photographic plate shows distinctly that the more finely-ground material—that which gives the smoothest surface—throws out more light than coarse particles.

PANEL PORTRAITS.

A visit to Paris has convinced us that this new and elegant style of portrait, which is already well known in this country, albeit it has not so far made much way, is likely to secure a firm hold upon public favour. We mean the portrait that measures seven and three-quarter inches by three and three-quarters, and which, unfortunately, has received a dozen different names. We had the pleasure during our sojourn in Paris to visit a series of studios, and although in every one of them we found the panel portrait, it was, as with us, known under a variety of names. Carte de Paris, carte panneau, carte album extra, carte promenade, were some of the titles by which the portrait was designated, and in every case it was spoken of favourably. Most of the Paris studios of the first rank have formats of their own, which they naturally enough press upon the attention of their customers, some larger, some smaller, than the panel portrait, but this is always to be seen in the display made in salon or studio.

Next week we shall begin our descriptions of the Paris studios we visited, under the "At Home" column. It will interest photographers in this country, we are sure, to read of the studios of their brethren in the French capital, as also to learn something of the ideas and views our neighbours entertain upon matters photographic. These we shall endeavour to pourtray to the best of our ability.

Notes.

There is no need, says our friend M. Warnerke, to develop a gelatine plate in ruby light. After you have once put the impressed film into the developing liquid, you may bring bath and plate out of the dark room, and continue to develop without injury, so long as you do not actually venture into full daylight.

A weekly newspaper has been started in Paris, called *Camées Artistiques*, illustrated by photographic portraits. The first illustration was a portrait of Ambroise Thomas, the composer, and the second of Mlle. Sarah Bernhardt.

It is all very well to take part in a "Toy Symphony" for once, to oblige a viscountess and to help a charity, but the big musicians who assisted might well be pardoned for objecting to be photographed with their infantile instruments in hand. Mr. Charles Halle, Sir Julius Benedict, and Mr. Arthur Sullivan, playing upon the penny whistle or Jew's harp, scarcely make a dignified picture.

There has never been a doubt as to the good policy of keeping one's negatives, but photographers sometimes, when new to their work, fail to appreciate to its full value their stock of glass. "My first hour's work of a morning," said a well-known photographer discussing the subject, "is taken up with orders from old negatives. Two years ago an old-fashioned couple entered my studio and paid me half-a-guinea apiece for a dozen cartes. To-day I am £150 the richer for keeping that pair of negatives, for I have reproduced the pictures in almost every conceivable form to meet the demands of friends and relations."

Our readers will be glad to hear that M. Adam-Solomon is in good health, and still continues to spare time from his work as a sculptor to devote to photographic portraiture. We had the pleasure last week of calling at his villa in the Bois de Boulogne, and examining further examples of his exquisite work. His pictures are still executed in the same bold, yet delicate style, that made his name famous in 1867. The dimensions of the pictures are also the same. Plenty of rich shadow in contrast with bright, but not glaring, high lights are still the main features of the Adam-Solomon school, which has found so many disciples in all parts of the world.

Good for photographers, at any rate. We have had a neatly engraved note placed in our hands to the following effect. "Mr. and Mrs. Dash are desirous of forming an album of the portraits in costume of all friends who honoured with their presence Mrs. Dash's Calico Ball; with this view they would be happy to exchange portraits at an early date."

One of these days a camera will be an accustomed piece of furniture in the drawing-room, and guests as they arrive will be "taken off" immediately after sipping their tea and coffee.

At its ordinary meeting, on the 10th May last, the Photographic Society of Vienna celebrated the 20th anniversary of its foundation. In honour of the occasion the gold medal of the Society was conferred on its president, Dr. E. Hornig, for his lengthened services in the cause of photography in general, and for the benefit of the Society in particular.

At a recent meeting of the Photographic Society of Belgium, M. Massange expressed an opinion that the grey tint so often observed in platinum prints is due to washing in water containing lime. Oxalate of lime is deposited in the pores of the paper, and no amount of subsequent washing avails to remove it.

Herr Husnik, of Prague, has taken out a patent for an improved transfer paper for photo-lithography. The paper is first dipped in a bath of 1,000 parts of gelatine and part of chrome-alum in 2,400 parts of water. When dry it is albumenised, and then sensitised in a mixture of 1 part of chrome-alum, 14 parts of water, and 4 parts of alcohol. The latter substance is employed to prevent the albumen from dissolving. In the parts not exposed to the light the albumen dissolves in the water with the colour with which the exposed paper is coated. The printing ink consists of:—Black printing ink 20 parts, wax 50 parts, tallow 40 parts, rosin 35 parts, oil of terebenthine 200 parts, Prussian blue 30 parts.

"Where can I buy an enlarged portrait of Thackeray?" was a question addressed to us last week, and which we now beg to pass on. There is surely a field here for some enterprising firm; large carbon prints, well finished, of Thackeray, Dickens, Prince Albert, Brunel, Faraday, Balfe, Daguerre, the Duke of Wellington, Fox Talbot, Palmerston, Sir Charles Wheatstone, to name a dozen men at random of whom there are light-pictures in existence, would command a ready sale in these days, now people are getting tired of hanging their walls with second and third-rate engravings.

According to the undulatory theory, what we call light is, as our readers know, an impression produced upon the retina of the eye by the wave-like motions of particles of matter. To show the difference between red light and violet light, a difference that the photographic plate appreciates so keenly, Dr. Lucian Howe tells us that the waves of the red are nearly twice as long as the waves of the violet; in other words, it takes 36,918 waves of red light to make an inch, whereas 64,631 waves of violet light are required to make up the same measurement. The number of these minute light waves that strike the eye in the course of a second is obviously very great, amounting, we are told, to millions of millions.

The Vienna Photographic Society numbers at this moment 384 members; the principal society in Berlin, 381; and the Photographic Society of Great Britain, 302 members.

Topics of the Day.

"SO MUCH FOR EMPLOYERS WHO KNOW NOTHING OF THE BUSINESS."

BY GEORGE BRADFORDE.

THE above is a quotation taken from my "Topic," entitled "Unhealthy Dark Rooms," and as it is pregnant with a deeper meaning than what appears on the surface, or first reading, I have chosen it as the title of the present paper. To how many operators, retouchers, &c., will this same paper awaken some recollections of the past! Who is it that with over a dozen years' experience has not heard the unctuous and friendly voice declare, in frank, bewitching tones, "Now, you know, I know nothing whatever about the business, so you will have it all your own way? I care not what you do, or what you want—you shall have free scope, only—please the customers and make it pay!" A Pecksniffian smile finishes the generous fraud, and the innocent applicant feels quite brave and happy. I was once an innocent applicant myself, and can testify to the swelling bosom and the high hopes that such words inspired within me.

Before I go further I must state that I do not allude to those gentlemen who, with a shrewd eye to commerce, speculate in our business, and act conscientiously up to the promises they make to their assistants—who treat them with the consideration that their application, energy, and talents demand—who, in short, treat both their assistants and their customers fairly in the scales of justice. With these honourable employers I have nothing to do; it is of another class that I treat—a class that blames the assistant for every whim of the sitter—a shallow-minded set that can only grasp in their dull brains the petty complaint of an occasional sitter, and conveniently forget the happy termination of previous successes. I do not write in anger, as my paper will show—rather the reverse, as I mean to show such capitalists how they act unfairly to themselves, their customers, and their employés. And I mean to say a word to said employés likewise.

I may state that I am not going into the vexed question of bad masters and bad men, but will instead show what I mean by the above title, by taking as my examples a good master and a good man (as the world goes), and show where each was wrong, and each was right, and how it was that they could not pull together.

We will commence by saying that a master saluted a man in much the same terms as I have mentioned above; the master clacks his fingers cheerfully, and the operator thinks pleasantly that he has fallen on his feet; it will no doubt, he thinks, be far better for him than his last situation, where his governor knew everything about the business, and was for ever at him about something that had to be done, or something that should have been done; and showing him the way to do this or that; indeed, he felt certain that he would here have immunity from lots of the ills that assistants fall heir to—he would, in short, be his own master. All his trouble now would be to do his work—he knew he could do that; but then the pleasure of being allowed to do it his own way! So that he was prompt with his proofs, attentive with his orders, and made it pay, it would be elysium! He felt so happy, really happy, after his first interview, that he went to bed and dreamt of the smiling face of his new master, and saw delighted customers giving huge orders from their matchless proofs.

With the next morning came the first hitch in the operator's dream, and the first frown clouded the serene brow of the worthy master. The last operator had been obliged to leave before he had an interview with his successor, who thus was left to *find out* everything; for, as my readers must know, there are tricks and dodges in almost every studio that would take a new comer months to learn by the means of *finding out*, when half-an-hour's explanation from the knowing one would have made him *au fait* at once. Thus our operator incautiously asked the master that morning if he could tell him anything about the dark room.

"God bless you, no! I know nothing whatever about the business!"

The operator explained that he should have liked to have known if the bath was in working order—where the chemicals were kept—where were the dark slides—the carriers, &c., &c; to all of which questions the master gives his former reply, accompanied with a rather suspicious look. The operator sees the look, and his confidence in himself gets the first shock. His ignorant master judges him by his own standard; and, indeed, it is so, for the worthy man goes straight to his wife, and with a dubious shake of the head informs her that he rather thinks he has not got hold of such a clever fellow as he thought—"Wanted me to tell him about his dark room and stuffs, my dear!"

The operator now sets to work like a man; tests and tries his bath; gets a clean negative of the posing chair; looks after the bottles, and arranges them so that they should come easy to his hand, &c.—when his master appears again, and with a curt question asks if he has got everything right, as there are some customers waiting.

Now there falls upon the miserable operator a week or perhaps a month of wear and tear—physical and mental—a time, in short, never to be forgotten! He has a badly-lighted glass room, with curtains that he has to shift for every sitter. During the time he is conquering his lighting, the suspicion of his master redoubles, and he informs his wife that he is certain his operator has not had much experience, and is not as he represented himself—a first-class man.

How unfair the master is I leave you to judge.

The lighting at length conquered, and the customers, as a rule, proving pleased, our operator has at last a little gleam of happiness; but during his probation do you not think that he has wished his old governor beside him to explain and make things easy with his knowledge and experience? Did he think so badly of him now, and did he not begin to see that there was a possibility of the master who knows nothing of the business whatever being in the end the worst instead of the best? And now a feeling of distrust, flavoured with contempt, took possession of the operator, for he saw and understood the arrogant bearing of his master. Instead of having his master to support him, he now had to undergo the irritating and thankless work of trying to make things plain to his suspicious and ignorant master. Such remarks as "How is it that this man's hair is so dark when he is fair?" "Why, this lady's dress was a beautiful blue, and you have it a dirty white. How's that?"

All this the operator tried to explain, but he felt that he was not believed. In vain might he protest that the fair man's carroty locks would photograph black or the lady's blue dress white.

"I think there's something wrong with your chemicals!" would be the master's sage remark.

Then, again, some thoughtless busybody passes the careless and casual remark to the master that he thinks his pictures are not so well finished, not so clear, as they used formerly to be. With a master who understood the business, or even could discern between good and bad work, this interloper would be treated as he deserved; but, as it is, it is all swallowed as gospel, and goes down against the operator along with the distrust that has evidently hankered in his master's mind since the affair of the dark room.

"People are complaining," he vaguely asserts, "that your pictures are too dark, or too flat, or too hard. How is it? I don't think that you retouch them enough!"

Such continual and irritating behaviour is hard to bear,

even by the most enduring and patient of operators; but to those who are placed with such a master, I advise them to bear it with heroic patience—to live it down with manly perseverance. Apply yourself to please your customers solely: make the best work that you can, and the result will pay you all your outlay. If you attend to this the customers will be pleased, and the business pay, despite the weak-minded master. When you find that the business is increasing—when the books show twenty or thirty pounds per month over the preceding year, then behave like a man, and firmly bring to your aid those dumb but damning witnesses. You have now won the battle! You care not now whether he behaves towards you as an honest man should, or whether it ends in a month's notice. He is bound now to give you the good character that is indispensable to the operator whose ambition prompts him to seek a place in a high-class studio. But, on the other side, had you lost temper (as I must own would have been most natural), you placed yourself in his power. "A fellow with a temper like that," he would most likely say, "is enough to frighten the devil away from the place." And the upshot of it would have been a discharge without a character, or, which is equally as bad, a very doubtful one.

All I can say to the master is, when he engages a man with high recommendations, he should at least give him a fair trial. As an honest man he is bound to put the number of customers that are pleased into the balance, and compare them with the moiety of grumblers—he is bound to consult his debit and credit, and from the results deduct the answers he should make to those isolated and unhappy wretches who take some demoniac pleasure in doing as much harm as they possibly can. I would likewise tell him it would be for his own interest to encourage his operator, and to defend his talents when those backbiters complain. How can he for a moment think that his place would get a good name if he himself spread the report that his operator was for no good?

I could go on a long time yet, but I am afraid it would be of little use for the employer who knows nothing whatever about the business does not read this paper. "Bless you, what good would it be to me? That is my operator's paper!"

Ah! ah! So much for the employer who knows nothing about the business!

The "Topic" for next week will be "On the Change in Gelatine by Long Digestion, and its Influence upon Bromide of Silver Emulsion," by Dr. J. M. Eder.

CAPTAIN ABNEY'S LECTURE ON PHOTOGRAPHY AT THE SOCIETY OF ARTS.

At the Society of Arts last Thursday week, but too late for us to notice in our last issue, Captain Abney read a paper on "Some Recent Advances in the Science of Photography," of which we give a brief abstract:—

The first topic the gallant lecturer touched upon was naturally the gelatine process, which has been born and has come to maturity since Mr. Spiller, in 1875, gave a lecture at the same place on a similar subject. He alluded to the exquisite sensitiveness of the plates, and was able to happily illustrate his remarks on this subject by throwing on the screen the view of the pond, trees, and swallow in full flight by Mr. Gale, which attracted so much attention at the Photographic Exhibition last year, and also by some excellent transparencies from instantaneous pictures taken last year, and recently by Mr. William England.

After praising the process for its rapidity and cleanness, the lecturer had a stone to throw at it (as might be expected from his previously expressed views on the subject) in regard to the impracticability of giving local intensity to a negative, a fact which he endeavoured to illustrate on the screen by means of the lantern. He touched also upon the subject of the introduction of iodide into an emulsion, and then proceeded to describe Mr. Warnerke's tissue as used in the collodio-bromide process, many samples of which were passed round for inspection. By an easy transition the photography at the red end of the spectrum was more than touched upon, and the applications of the method to chemical research were practically demonstrated. It was shown, in fact, from photographs of the absorption spectra of ether and water, that these liquids are really coloured substances if the dark part of the spectrum below the red can be said to have colour. This, and some other photographs of the spectrum showing meteorological changes in the atmosphere, completed the first part of the paper.

The lecturer next gave an account of his researches on the destruction of the photographic image by oxidizing substances, with which our readers are already acquainted, and showed how these experiments had gradually landed him into seeking for an explanation of the colours obtained by Becquerel and Niepce de St. Victor. He found them to be due to the oxidation of sensitive salt which had been previously exposed to light. There was a partial reticence exercised here, no doubt for some good reason; but the audience would evidently have been more gratified had more been said on the subject, and if more specimens had been visible. The excuse for this paucity, however, is one which must be admitted as valid, for he mentioned that so many of his friends were beggars that he literally had brought all the examples he had left.

The next advance touched upon was the platinotype process, which was practically demonstrated by Mr. H. Berkeley, and was in every respect satisfactory, one print after another being developed with the greatest ease and rapidity. The many fine specimens upon the walls, amongst which were some of the beautiful enlargements made by Mr. Willis in America with the aid of the electric light, were pointed out as to the capabilities of the process.

Captain Abney next demonstrated his "printing by development" process, which seems to our mind to have made a certain amount of progress since he first exhibited it at the meeting of the Photographic Society, and then made some allusions to the iron printing processes for the reproduction of plans and drawings. A reference to the new printing modification of the Woodbury process and the adaptation of Spence's metal, by Mr. Wernerke, for the production of the moulds, was appropriate; but naturally little was said on the subject, as so little is known at present, at all events in England, of the practical working details.

The Autotype Company had sent specimens of their Photo-Mechanical Printing Process, and certainly they were as fine prints as we have seen commercially produced by any phototypical process. These were kindly allowed to be distributed by the owners. Some specimens of Warnerke's photo-engraving process, and a description of his phosphorescent photometer, closed the list of subjects treated of by the lecturer. He concluded by saying that the goal to be aimed at now was photography in natural colours. He held the view that the colours that were produced were real pigments (and we suppose inferentially capable of being fixed), and that being the case we might hope eventually to succeed in depicting any object in its natural and true colouring. Regarding the diaphote, he had but little hope of its being practicable.

After a few remarks by Mr. Spiller, and by some gentleman who seemed to think that the great feature in photography was its application to medical science, Mr. Norman Lockyer, who occupied the chair, closed the discussion by calling attention to some prophecies he had made when delivering his Cantor lectures to the Society of Arts. Most of those prophecies had been fulfilled by the lecturer's researches into the molecular state of silver bromide, and that

thus the lower end of the spectrum had been faithfully pourtrayed. In regard to the future, he ventured to prophecy again, and this time that photography in natural colours would be a fact accomplished before long. Judging from the researches of Kuhné on the eye, he saw no reason to doubt that the photographic plate might be made as susceptible of being impressed by colour, as was the visual purple, two, or at the most three, molecular groupings of the same matter being only necessary to give any and every colour.

NEGATIVES COPIED BY THE AID OF LUMINOUS PAINT.

BY LIEUT. DARWIN, R.E.*

I have brought with me some negatives and transparencies to exhibit to the Society rather as curiosities than with the hope that the process by which they were obtained may ever become practically useful. The account of a failure is often worth publishing, either for the sake of seeing whether a process which has failed with one operator may be successful in more skilful hands, or, if the failure is a hopeless one, for the sake of saving others the trouble of going over the same useless ground. Whether the publication of this process is likely to be useful from either point of view, I will leave to the Society to decide.

I have here a negative which has been reproduced from another negative without any transparency having been taken. It will be seen that there is plenty of density, and that the whites are fairly pure, but that the whole has the appearance of being much out of focus. The method of obtaining this negative suggested itself to my mind when trying some experiments with Balmain's luminous paint. This substance, which is, I believe, a sulphide of calcium, or some compound closely allied to it, is strongly phosphorescent in the dark after having been exposed to the light. It is, however, only the blue and violet rays that have this effect, and red light not only has no tendency to make it glow in the dark, but actually blots out the light from the phosphorescent surface. It would perhaps be more scientific to say that the phosphorescence diminishes far more rapidly when exposed to red light than when in absolute darkness. I covered a sheet of glass with the paint, and allowed it to set for a week or more. Having exposed this plate for three or four seconds to sunlight, it was rapidly placed on a negative in a printing frame, with the painted surface touching the film. Between the negative and the light was a sheet of red glass. Thus the transparent parts of the negative allowed the red light to pass through, which destroyed the luminosity of the surface, whilst underneath the dense parts, where it was protected from the red light, it continued to glow. After being exposed to sunlight for about a minute and a half, the frame was brought into a dark-room, and the plate taken out, when it appeared as a luminous negative. It was then placed in contact with a dry plate for about thirty seconds, and the plate developed—and this is the negative that I have here to-night. I have also tried photographing in a camera this luminous negative, thus getting a reduced negative. The result was, however, blurred, indicating probably that there was a want of sharpness in the luminous surface. Transparencies can easily be taken by exposing the surface of paint when not luminous under a negative. I have here some which are sharper than the negatives from some cause that is unknown to me. I have not yet succeeded in performing all these operations in a camera, but I think it can be done.

* Read before the Photographic Society of Great Britain.

Correspondence.

TRANSFER OF THE GELATINE FILM.

Sir,—Could any of your readers tell me in your next issue if it is possible for me to transfer a gelatine negative film from one plate to another, and how it is done?

The plate of the negative I have has, by some means, been broken, but I do not think the film is injured at all. Any information will greatly oblige yours very truly,

Amateur.

[Perhaps some of our readers have experience in the matter.—Ed. P.N.]

STUDIOS WITHOUT BLINDS.

Sir,—With reference to the great photographic topic of the day, dry plates, it has been said that the gelatine process has an advantage over the old wet process on account of the great rapidity of exposure gained by its use. On the other hand, it is argued that a dry plate does not give so good a photograph as a wet one. Now in my opinion there is no necessity for giving up the wet plates; but there is a necessity for an alteration in the form of the studio.

I send you a photograph which I took about a month ago, on a bright day, and the exposure was three seconds. I do not think there is any need for a quicker exposure than that. It was taken with Ross's Cabinet Lens (2 C).

My studio is built on the same principle as that of Mr. Samuel Fry, and I find that in it I can take a well-lit picture of any style, whether Rembrandt, American (like the one I enclose), or ordinary. I know there is a great prejudice against dropping the use of blinds. For my part, I never mean to use blinds again, as I am convinced that with a studio like mine there is no need for them.

The two great advantages of the new form of studio are, remarkable quickness of exposure, and simplicity and quickness in posing the sitter.

I therefore think that if photographers would do away with the old form of studio and adopt the new, they would gain the desired quickness of exposure without using dry plates. They would also find studio work far more simple. —Yours truly, Herbert H. Harding.

FIXING PRINTS.

Sir,—Would you kindly allow me to ask your readers if any of them will be good enough to state the cause of a complaint with which I have been much troubled lately?

This is a metallic glitter attacking my silver prints, and yellow hue which seems to be visible to the fullest extent when the photograph is thoroughly finished, although there are traces of it in the hyposulphite fixing and even toning solutions; sometimes a part is quite clear, with a sharp line between the healthy and affected parts, as if a print lying over the top of it had prevented contamination all over. I feel confident that hyposulphite of soda is the cause of the evil, although my efforts to trace how so have been useless. Perhaps some of your subscribers would explain to me, and oblige yours very truly, Printer.

CANARY MEDIUM v. RUBY GLASS.

Sir,—Without entering upon or desiring a lengthy discussion, permit us to say that your correspondent, Mr. Bridges, in his letter published by you on the 21st, is entirely wrong in the assumption that we used *tissue* paper in making the tests referred to in our letter which you published on the 7th. What we did use was a piece of the *real canary medium*, supplied by Mr. Bridges himself, or by his instructions, to a member of the West Riding Photographic Society, and also a piece of similar paper sent to us by the makers as being a sample sheet of the precise article used by Mr. Bridges. We therefore had two strings to our bow, and, both being exactly alike, we have no reason to doubt that we had anything but the "real medium." We believe we enclosed a small piece to you in our former letter; if not, we do so now, and will ask you kindly to compare it with that sent to you by Mr. Bridges, and if you say they are not identically the same, we are open to accept the correction. In our hands, under three different tests, it gave such results that we must reiterate our opinion as entirely in disfavour of its use for developing an *extra sensitive* gelatine plate, and this opinion has recently been endorsed at more than one studio in the county of Gloucester, where, from personal observation, we are warranted in taking exception to the statement that "ruby is entirely snuffed out." We should only be too glad to adopt the use of a more comfortable light than the ruby-orange; but when the

spectroscope reveals the fact that the "canary medium" in question intercepts only the violet and blue rays, our faith is not strong enough to believe that the green rays (which are freely admitted through it) would be harmless —indeed, they are not so upon our plates, whatever they may be upon others. Thanking you for the courtesy of publishing our letters, we are, sir, yours faithfully,

D. H. Cussons and Co.

MODIFYING THE OXALATE DEVELOPER.

Dear Sir,—Further experience with the ferrous oxalate, according to Dr. Eder's formula, shows that there are several means of modifying the action of this developer on the exposed plate. The addition of methylated spirit, in the proportion of about one-fourth of the whole, seems to preserve and accentuate the vigor of the solution in a remarkable degree. I had occasion last week to develop about seventy-five 10 by 8 plates exposed by Mr. Vanderweyde with the electric light, on *tableau vivant* groups at Kensington, when with this alcoholic addition about 40 oz. of solution sufficed for the whole, the energy being little impaired at the end. Again, glycerine has as beneficial an effect as with the pyrogallic, conserving the clear parts of the pictures in a remarkable manner. Both glycerine and bromide, and in a remarkable degree the two combined, seem to give a valuable control over the development, and enable one to counteract the ill-effects of over-exposure. In fact, further experience leads me to the belief that the controlling power is nearly as complete as with pyrogallic. Some remark on a certain opalescence of the film, which seems to impair the brilliance, but this is simply in the gelatine, and gives way under the varnish. Two great points of advantage stand clearly forth in favour of this system—first, that intensifying is rarely needed, and when required is got without difficulty or fear of having an evanescent image; and secondly, that the image is similar in appearance to wet collodion, consequently of a colour the printing value of which can be perfectly estimated. This I look upon as a most important point, and removing about the last objection to dry plates, for it cannot be denied that a serious difficulty has existed in the liability to get these yellow pictures.—Faithfully yours, Samuel Fry.

PAYMENT OF ASSISTANTS.

Sir,—For the past five weeks this question has been before your readers. I am sorry that the "Operator of Six Years' Standing" did not put the question in some other way for the good of his reputation. I would not quite dishearten him, but, nevertheless, six years is too short a time for him to call himself an operator or assistant operator, as we all know that employers expect such to understand not only the taking of good negatives, but to thoroughly understand lighting and posing, and be well up in manipulation. I, for one, would advise him to look well into the subject before taking an engagement as an assistant operator.

As regards payment as operator, I can endorse your correspondent "H. B.'s" statement; and, I think, had your former correspondents, "Beau Nash" and "J. Kay," given some practical advice in answer to the so-called operator, it would have been more to the point.—Faithfully yours, W. J.

Proceedings of Societies.

Photographic Society of Ireland.

A meeting was held in the Royal College of Science, on Friday, May 14th, Mr. J. V. Robinson in the chair.

The previous minutes having been confirmed,

Mr. Conan exhibited and described a drying box for gelatine plates, which he had recently completed, also a drop shutter for rapid exposures.

Mr. Thomas Mayne showed a number of lantern transparencies on gelatine plates, which were variously developed, and explained the different methods by which he had endeavoured to get rid of the usual veiled appearance, and which was found to be altogether obviated by cementing the protecting glass to the positive with Canada balsam.

Some good specimens of mechanical printing were exhibited and described by the Chairman, and which were in their line considered worthy of every admiration.

The Secretary drew attention to the fact that the information on the photographic power of phosphorescence, lately brought before the Photographic Society of Great Britain, at their meeting on the 11th inst., had already been communicated to the Society by Mr. J. V. Robinson at the meeting of the 13th February last, a report of which was published in the journals of the 27th of the same month.

This being the concluding meeting of the session, it was announced that the next meeting would not be held until October.

The presentation print for the year was then distributed to the members present, after which the proceedings terminated.

Bolton Photographic Society.

The ordinary monthly meeting was held at the Baths, on the 6th inst., Mr. Thos. Parkinson in the chair.

After the minutes of the previous meeting had been read and confirmed, a series of out-door meetings, to be held fortnightly, were arranged for the summer months,—the first to be at Worsley Hall, on the 29th inst.

A number of instantaneous views were exhibited by Messrs. Harwood, Shipperbottom, and Grundy, of the opening of the New Infirmary on the 1st inst., and Mr. Shipperbottom also exhibited an instantaneous shutter.

A monthly meeting of the Council having been arranged, the proceedings were brought to a close about 9 p.m.

Photographic Society of Vienna.

The following is the list of prizes which the Photographic Society of Vienna offer for competition in the course of the present sessional year:—

Voightlander Medals.

(Open to Members of the Society only.)

1.—A gold medal, value 140 ducats, for a method of increasing the sensitiveness of wet plates.

2.—A gold medal, value 140 ducats, for the most reliable and sensitive dry process.

3.—A gold medal, value 50 ducats, for researches into the gelatine emulsion process.

4.—Medals in gold, value from 40 to 100 ducats, in silver and in bronze, for scientific treatises, discoveries and improvements which have been published in the official journal of the Society (the *Photographische Correspondenz*).

5.—Medals in silver and bronze for the achievement of valuable results in the practice of photography.

Society Medals.

(Open to Members or Non-Members.)

1.—A gold medal, value 140 ducats, for the production of plates in relief for printing copies of drawings in half-tint.

2.—A gold medal, value 140 ducats, for monograph on pyroxyline and collodion.

3.—A gold medal, value 140 ducats, for an improvement of the collotype process which will render unnecessary the constant wetting of the plate between the pulls.

4.—A gold medal, value 50 ducats, for a vigorous investigation of the conditions of sensitiveness of asphalte.

Further particulars of the competition are contained in a detached programme, which, together with the prospectus and rules of the Society, will be forwarded post paid on application to Dr. E. Hornig, 9, Hauptstrasse, Vienna III., to whom also should be addressed applications for admission to membership.

Talk in the Studio.

South London Photographic Society.—The last meeting of the present session will be held on Thursday next, June 3rd, at 8 p.m., in the rooms of the Society of Arts, Adolphi. Mr. J. S. Hazard will read a paper on "Gelatine or Collodion—which pays best?" and other matter of interest will be brought before the members.

A Photographic Action.—At the Clerkenwell County Court last week the case of Ellis *v.* Kennington was heard before Mr. Judge Whitebread, in which the plaintiff, a photographer, sued the defendant to recover the sum of £5 for goods sold and delivered. It appeared from the plaintiff's opening, for whom counsel appeared, that the defendant in April last ordered a portrait of a lady to be finished in oil upon an agreed price stated in particulars supplied to the Court, and that no date was specified for its completion, but that it was to be done as soon as possible, and that the order being a work of art was completed within three weeks, and sent home. From the nature of the work it could not be finished earlier, as after the proof was taken it was in the artist's hands, who had executed it with all consistent dispatch. A Mr. Campbell was then called, who said that he was the artist employed to paint the proof, and no time was lost in doing so. This being the plaintiff's case, the defendant, who conducted his own case, said the picture was ordered to be sent home on a certain day, but as the contract had not been complied with, he refused payment. The learned Judge, on looking on the summons, said that it had been taken out for goods "sold and dilivered," but from the evidence before him it was not so, as the plaintiff had not delivered the goods. However, the summons might be for "goods sold," and in that case the plaintiff might recover. It was urged, on the part of the defendant, that there was a specific contract, which not being carried out, he had a perfect right to refuse acceptance of the picture. His Honour ruled that there was no evidence of a special contract, and under the circumstances it ought to have been in writing. In amending the summons, the plaintiff was fully entitled to the amount he claimed by giving up the photograph in Court to the defendant, who was ordered to pay the amount claimed, with costs.

A New Emulsion.—Dr. Vogel writes us:—"I have a new emulsion with remarkable qualities. It combines the advantage of gelatine emulsion (high sensitiveness) with the advantages of collodion emulsion. It appears to keep any length of time, and, best of all, it may be poured like collodion upon the glass, drying as quickly as the latter. The plates are developed, intensified, fixed, and washed exactly like collodion plates, and dry like these. Moreover, the film may be exposed in the camera seven minutes after preparation and before drying. You will be glad to hear that several of our Berlin photographers—Prumm, Schaarwachter, and Reichard—have tried the emulsion, and reported upon its success, to the Society for the Advancement of Photography. You may smile over all these wonderful things, but they are so convincing to me that I am seriously thinking of making the emulsion on a large scale."

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, "*Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

Enamel.—See our recent leader on coloured photographs; that is what you allude to, probably. We have never tried enamelling with collodion and gelatine for coloured photographs as ordinarily used for glazing, but if you employ aniline colours, the process should answer. Indeed, we see no reason why, with care, pictures coloured in the usual way should not be so treated. We have published several enamel processes of the above nature; but if you are unacquainted with them, let us know.

Carl Derptsch.—Tone your transparency with gold and iridium; if you will refer to "Answers to Correspondents" for the past three months, you will find we have given the formula two or three times, together with directions as to development. The tone is perfectly permanent.

A. R.—We can well understand your trouble; you certainly must give up dipping your fingers in bichromate solution, which exercises a corroding effect upon the skin. An occasional dipping of the fingers in the bath does not matter, but constantly doing so is often very injurious. With a piece of wood to lift the sheet, and an india-rubber finger-stall on forefinger and thumb, you will be able to avoid all contact with the liquid.

Toning Bath.—1. The chalk is added to neutralise the free hydrochloric acid which usually exists in chloride of gold. 2. Rub your plate with a little powdered talc before coating.

F. H.—You can purchase vignetting glasses at any dealers, or make frames for yourself by simply cutting an opening in cardboard and fixing this in front of the printing frame, cotton wool being stuffed round the edges of the opening to soften the outline; during printing, the position of the frame should be shifted occasionally. Put into hot water with some soda, the old films will soon leave the glass.

Oxalate.—The lateral deposit spoken of is not sufficient to interfere with your lantern slides; we referred to it in connection with astronomical and microscopic work, where very accurate measurement is desirable.

Negative Spoilt.—We fear you can do but little. Two courses are open to you: either to endeavour to reduce the film by repeated applications of a five or ten per cent. solution of cyanide, or to bathe the film alternately with a solution of iodine and hyposulphite of soda. We should recommend the latter course.

Alpha.—See Answers to Correspondents in News of May 7th, under "Photo-Transfer." If you want further particulars, let us know.

Thos. McCann.—The iodizing solution is made by dissolving certain proportions of iodine and bromine salts in alcohol; but in your case it would be far better to purchase; no doubt a dealer would let you have what you require. For your ferrotypes we should recommend a stronger bath than you are using, say forty-five or fifty grains of nitrate to the ounce of water. This would probably get you out of your difficulty. There is a good paper on the subject in our Year-Book for 1879.

F. S.—Under the circumstances, it must be the gelatine at fault; if you have used the same kind for all three formulæ, this is additional proof. We are conversant with the defects, which are attributed to the presence of a fatty substance in the gelatine. The addition of ammonia will doubtless put matters straight.

Lieut. Erin.—1. After the barrel has been well soaked you need have no fear. 2. It cannot be done satisfactorily; you must remove the varnish first with alcohol, and this is done with least risk by permitting the film to rest face downwards for some time upon a dish containing the liquid, and then flowing it with spirit. Then wash and proceed as usual.

W. L.—See News for Feb. 1, 8, and 15 in 1878. Our Publishers can supply you with the numbers.

Wirksworthe Artiste.—1. Put your negative in a ten-grain solution of bichloride of mercury; afterwards wash, and treat with a five or ten grain solution of cyanide of potassium. 2. It is preferable to mount after enamelling, unless you employ a non-aqueous solution, such as india-rubber cement, for instance. Gum, glue, or starch may injure the enamel. Enamelling is not easy. The simplest process is to cover a glass plate, rubbed with talc, with collodion, adding a drop of castor oil to the latter if you like. Then pour on a solution of gelatine, and place the unmounted print face downwards, the print being also coated with gelatine first of all. Mount on the glass, and the picture will strip off when dry. 3. Usually, they are spotted or roughly touched; but you may order as you please. 4. Your cabinet lens may possibly take a promenade or panel picture; you must try it. Of course a bigger lens would be better.

G. W.—There is evidently a deficiency both of albumen and silver. If your bath gets weak (the amount of acid it contains is no trustworthy criterion of its strength) the albumen dissolves off; therefore we should advise you to strengthen your bath, or, if that does not help you, take a better albumenised paper. You may have got hold of a few defective sheets. In any case your negatives are so good that you should not risk printing them on a cheap paper, or employ a weak bath. There is very little the matter with the child on the swing.

Anxious.—No. 3 is not a bad result; but the model should have been lighted a bit on the shadow side, by reflection or otherwise. You are testing both plate and developer crucially by taking your pictures in an ordinary sitting room, about the lighting of which you gave us no description. Even if your lens did cover, you could hardly expect definition of the legs and feet if they are not properly illuminated, and in an ordinary sitting room this is not the case. Try a bust portrait only, and, before exposing, see that your model is fairly lighted; white paper you will find a good reflector, and do not place sitter too close to the window. The spots you refer to may have been due to dust on the plate when put into developer, but were more probably in the film itself. If you see the News regularly, you need not get another handbook, but Robinson's work on Pictorial Photography (Piper and Carter) would be worth your study.

A Beginner.—We fully believe it is not the developer, but your plates that are in fault. We have experienced exactly the same phenomenon you describe, and it disappeared on trying a new batch of plates. You *cannot* make a mistake in development if you attend rigidly to proportions, and simply immerse your plate as it comes out of the dark slide.

Amateur.—We will try the experiment for you. A zinc plate put into the liquid would precipitate the silver faster than copper; it would not be in the form of a sulphide, but pure metallic silver.

The Photographic News, June 4, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Proportion in Sizes of Pictures—On the Registration of the Chemical Action of Daylight—An Unexpected Cause of Fog in Gelatine Plates—Gelatine Tissue.

Proportion in Sizes of Pictures.—As we have pointed out from time to time, there is a growing tendency to alter the proportion of the sizes of photographs, and we have had at intervals the carte, the cabinet, the boudoir, and now the panel size introduced, and it becomes a question as to which has most perfect shape artistically rendered. There is no doubt that some proportions are more beautiful than others, and if we take that which is least pleasing to the eye it is the perfect square, since the eye readily detects the ratio. A double square, again, is better than the square—that is, it is more satisfactory that the ratio of one side to the other should be two to one than one to one; but the effect will be more pleasing if the proportion be, say, five to eight. In other words, proportions should be multiples of some simple unit, and yet of such a nature that they cannot readily ascertain what those multiples are. A very favourite size for a landscape is a plate 8½in. by 6½in., which is really the ratio of 17 to 13; but when a print is cut down, the proportion is usually 8 to 6—that is, 4 to 3—which is a very simple proportion, and one which to the eye is not altogether easy to make out. 8 to 5 would be a still better proportion, though for certain subjects which have to be taken with the longest size vertical, the horizontal breadth might be considered a trifle too narrow. The carte, as mounted, has the proportion of about 3½ to 2¼, or 14 to 9, which, on the same rules, is a size which satisfies the eye; and so we might go on. But another point that requires attention is that the proportion should be such that there is no mental unconscious endeavour to cut the picture into squares, and to guess how much is over after forming these squares. Sometimes we have a tendency to do this, very much as a sick man in bed, whose eyes are always on the walls, has a desire to make the patterns of the wall-paper run into lines and form monstrosities. The mental efforts in the two cases are probably very similar, and the effect on the mind is the same. At any rate, the size of a picture should never seem to invite these mental problems.

On the Registration of the Chemical Action of Daylight.—Dr. Angus Smith lately read a paper before the Royal Society on the registration of the chemical action of daylight by means of the exposure of a slightly acidulated solution of iodide of potassium in water. Such a preparation when left in the dark remains perfectly colourless, but when brought out into daylight discolours, owing to the liberation of iodine. This takes place more or less rapidly, according to the intensity of the daylight. The iodine he estimates by the volumetric method, with hyposulphite of soda or other analogous means, and so at any interval is able to estimate the intensity of the incident light. This is not the first time that this method has been proposed—in fact, we only recently heard of it in another quarter, and its utility seems rather doubtful when so many other means are at hand. It is simply out of the question to use it for meteorological purposes, since the tediousness of the estimation of the liberated iodine would prevent its adoption at any station, except one which might chance to have a staff of supernumeraries. Again, another objection is that it only registers at long intervals of time, and that therefore it will not give an accurate quantitative measure of actinism for a whole day. Even Roscoe's instrument is deficient in this respect, as, we believe, it only makes a hourly registration. What we want is an automatic arrangement, which registers on a drum or cylinder the actinic power of daylight in a similar way to that in which the barometer or variation of the magnet is registered at Greenwich or Kew. Looking back a few months we find in Mr. Warnerke's paper the foundation of a process by which this can be accomplished, and it only needs some active-minded individual to take it in hand.

An Unexpected Cause of Fog in Gelatine Plates.—Recently, while out with our camera on a windy day, we exposed some half dozen gelatine plates on a variety of subjects, amongst which were two views of foliage taken with a single landscape lens, in which there were rotating stops. Though only two or three seconds were required to produce full exposure, yet, probably, to get that, we had to wait a quarter-of-an-hour with the front of the slide pulled out and the cap on the lens. On developing the plates at home, we were surprised to find that the whole of the negatives were excellent and bright, excepting these particular two, which were veiled to a very considerable extent. Many were the conjectures formed regarding the cause of fog, and it was only by accident that we found the reason of it. We replaced the cap on the lens, put on the cap, and examined the inside of the camera with a focussing cloth over our head, and were surprised to find that the stops were illuminated—feebly, it is true, but still sufficiently to fog a gelatine plate. Here, then, was the cause of our disaster, and to take care that it shall not recur, we have glued a piece of black cloth against the stop, and made it light-tight. Of course a black cloth over the aperture in which the rotating stop is placed would have sufficed, but this would be moveable; whereas, by the small artifice employed, no want of memory will ever be the cause of a faulty negative. With the old wet process, or any other dry process, the small infiltration of light was quite unimportant, but as matters now stand it is much more serious. The views we tried to obtain were such as we should never have attempted on a windy day with the old slow plates, as it would have been impossible in anything like moderate time to have secured adequate exposure. It is seldom, however, that in the most gusty day two or three seconds cannot be found in which the lull is sufficient to cause foliage to be tolerably still.

Gelatine Tissue.—We have heard rumours, though we cannot answer for their correctness, that gelatine emulsion has been successfully applied to long strips of collodionized paper in such a manner as to allow the film to be separated and transferred to glass after development, in a very similar manner to that adopted by Mr. Warnerke in his collodion emulsion tissue. We hope, for the benefit of photography, that such is the case. We cannot imagine anything more delightful than to take a roll of such paper in the field, and so to be perfectly free from the weight of the glass plates, slides, or changing box, which encumber the walk of a pedestrian. It will be a grand day for the Alpine climbers if what we hear be true, and we may expect many subjects to be obtained which have previously been impracticable.

ABOUT GELATINE PLATES.

BY FOCUS, JUNR.

While so much is being ably written and said about the theory of gelatine emulsion, would not a little further attention to the practice of the process be commendable? Doubtless a great many very valuable experiments and discoveries are being made by our photo-chemists, for which we poor knights of the camera are to be truly thankful; but there seems to me a good amount of the "grass growing, and the horse meanwhile starving," about the business.

I know of three different photographers who, some time

ago, enthusiastically confined themselves exclusively to the use of gelatine plates, and they have all now returned penitently to their first love, collodion, and purely through the fickle nature of the former.

Of course we might "read up" and go into a course of experiments to make ourselves sufficiently wise; that is, if we had a requisite suite of laboratories; or we could use our own dark rooms if we were a sufficient time without customers, or "doctor up" a spare room if we had no assistants prowling about; or, again, we might lock the door, after leaving the stewing operations in a fair way, then become absorbed in some other duties, and only remember again in time to discover that our latest experiment was ascertaining the effect of the spontaneous combining of gelatino-bromide with carbonic matters, while the latter was in a state of active combustion.

I should experience an amount of satisfaction if I had an enemy who was a practical photographer, and he could afford time to attend to such items as boiling emulsion for three days. He must either have declined business, or business declined him!

As it is, photographers generally commence the working of gelatine plates in a more or less ignorant state, even as in the early days of collodion, when most things connected with it had to be personally discovered. Now if we depended only on our own experience and calculations, we might succeed quickly enough, for the part of the process that falls to the photographer's share with ready coated plates is really simple in the hands of a reasonably good wet plate operator, that is, when the plates are primarily right. But we purchase some samples from the makers, and with them the instructions for using, &c., which, in the cases that have come under my observation, mean literally (though possibly without intention), "be led by the nose, shut your eyes, work in the dark, and attribute all failures to your own ignorance." Of course we accept these instructions in our early inexperience, and all this is to unlearn. We have to convince our naturally conservative natures that modifications in developers, save in extreme cases, give us little extra control; that rightly timed exposure is the principal responsibility resting with the manipulator. We must learn that fog is not always, nay is seldom, caused by actinic light in the darkrooms, or an overdose of ammonia-bromide in the developing solution.

I suppose that gelatine plate preparers can go mad on a point as well as their neighbours. This some of them seem to be doing by frequently risking and obtaining a reduction in the emulsion by prolonged and excessive heating, the results appearing to yield a precisely similar fog to exposure in actinic light.

Their commendable desire is to obtain thoroughly instantaneous plates, which is acceptable enough, certainly, in cases of taking moving objects, or catching dramatic expressions, but I don't think that photographers otherwise yearn for extreme rapidity. I think that in ordinary cases a much finer repose is obtainable in features with an exposure of less than two seconds.

Moreover, it is evident that the preparation of the emulsion is very exacting—that, in short it can only be successfully achieved in careful, skilful hands; and I think it is only the fulfilment of a natural law that so long as the cause—young female assistants and gelatine—are employed in the same process, long will the effect—uncertain results—be in attendance.

Manufacturers, I am sure, are very anxious to succeed, and in my opinion the sooner they recognise that the local faults existing in gelatine plates are attributable more frequently to the preparation than to their after-manipulation, why the more rapid strides shall we all make on the road to perfection.

I expressed these views a few days ago to a gentleman moving in the first rank among gelatine emulsion experimentalists, and I was pleased to learn that it met with his hearty concurrence.

At Home.

THE MAISON LEJEUNE IN THE RUE ST. HONORÉ.

We have always had a sneaking fondness for the Rue St. Honoré. Despite the grandeur of the adjacent Rue de Rivoli, and of the broad Avenue de l'Opéra, with its massive shops and electric lamps, the Rue St. Honoré is quite competent to hold its own. From its less aristocratic end, where old-fashioned shops of the true Parisian type are still to be found—where salads, cheese, apricots, sausages, and other comestibles. are seen in queer little windows, where restaurants flourish, for the bourgeoisie, with the steaming kitchen on the threshold, so that customers may make up their minds as to the quality of the viands before entering—we repeat, from this unaristocratic quarter right away to the Faubourg, where the Elysée and the British Embassy are located, this favourite street of ours is full of interest. We are not particularly aged, but still old enough to remember the days when diligence travelling was resorted to on many of the French highways, and we have seen the heavy yellow vehicles swing out from under that archway in the Rue St. Honoré, which before the days of railways was the main point of arrival and departure with Paris visitors. The word "Messageries" still appears above that archway, and beside it, in newer letters, the word "Nationales"; it was "Messageries Imperiales," we remember, when we first saw it, a quarter of a century ago.

Very nearly opposite that hostelery, dear to English visitors, the *Hotel de Lille et l'Albion*, is a lofty building of white stone, wherein is situated the atelier Lejeune. The present head of the firm is Monsieur L. Joliot, and to him, both on behalf of our readers and ourselves, we tender thanks for a hearty welcome, and permission to visit one of the very first studios in the French capital. M. Joliot showed us unreservedly every nook and corner of his handsome establishment. That he had nothing of novelty to exhibit, was an assurance he gave us over and over again, but, that we might judge for ourselves on the subject, we were at liberty to go where we pleased.

M. Joliot's establishment is on the second floor. Two handsome salons, furnished with excellent taste, are at hand for the reception of visitors, and from one of these, half a dozen carpeted stairs lead to the studio. M. Joliot has a speciality in the shape of the *Cartes Russes*, which attracted considerable attention at the last International Exhibition. They are bust vignettes on a black ground. The style is especially suitable for ladies, and is pleasing to a degree. It was, indeed, these *Cartes Russes* that decided us upon an early visit to the Maison Lejeune, for, strange to say, although the cards are well known in Paris and St. Petersburgh, at home they are comparatively unknown. The Promenade or Panel portrait is also in favour with M. Joliot's customers, and we may here mention that, as with us in England, the Parisians have not yet made up their minds in respect to a general name for the format; "Portrait de Paris" is one of the titles by which it is known.

M. Joliot believes that there is fashion in photography as in everything else. The public are capricious, and they would just as likely take up with a style because it is fashionable, as because it is artistic and elegant. From the circumstance that the present costume worn by ladies is well rendered in the panel portrait, this cannot fail to become a favourite style, if for no other reason. Unfortunately, said M. Joliot, the present season has brought satin very much into fashion for ladies' dresses, and of all materials that plague the unfortunate photographer, this shining fabric is the worst. M. Joliot takes the liberty of advising his sitters as to the nature of their costumes; in his circular he says, "Costumes of white, blue, violet, mauve, rose, and light grey, should be avoided, except in the case of *Cartes Russes*, when these tints are especially to be chosen, since they are the only ones giving good results. Moirè antique, black velvet and satin generally produce unsatis-

factory effects; black, dark grey, green, yellow, chestnut, and brown, are good photographic colours."

M. Joliot admitted, however, when we referred to the subject of drapery, that the ideas of photographers had of late years undergone a vast change, and that many colours that were formerly regarded by the photographer with dislike, are now chosen in order to secure effect. To produce the best result upon a dark background, as in the case of his favourite style, there was nothing equal to "une laine claire" (a light merino or cashmere); and even colours like blue were not to be despised, since they were reproduced of a light tint, without the glare which white material shows if not carefully handled. Silk was very agreeable in a photograph, but was not rendered so well as woollen fabric.

M. Joliot's studio is exceedingly roomy. The dressing apartments open almost immediately into the studio, and further on is the laboratory. The studio is divided into two by a huge canopy, under which the cameras stand; the latter are thus capable of being directed to one end of the studio, or the other. One portion of the studio is devoted to the sole production of the vignetted portraits on a black ground. Here there is but a single background, of a dark red, so dark that it scarcely appears red at all. To produce the *Carte Russe*, the sitter is placed some eight feet from this background, so as to permit plenty of side light to intervene between it and the model, the result of which is that the finished portrait has something of a Rembrandt look, the features rounded, and standing out well in relief. On the shadow side of the sitter either white or blue curtains are arranged, to reflect back the light, and not to permit too much shade on this side of the face. A negative taken under these circumstances does not require to be manipulated at all so far as face and shoulders are concerned, since these stand out boldly from the black ground when the negative is printed; but some little skill is necessary to cut off the bust and print the paper black below the portrait. But this printing is of a "fond degrade," M. Joliot assured us, is a matter soon got over with a little practice, and it is altogether a subject of secondary consideration. A final darkening round the margin of the print finishes the picture. Portraits produced in this way, especially of ladies in light summer or ball-room dress, are exceedingly effective.

At the other end of the studio ordinary portraits are taken. M. Joliot employs Seavey's backgrounds. "No doubt our Paris artists could paint them as well, if they gave themselves the trouble, but they won't, and hence we have to go to America." M. Joliot does not stretch his backgrounds or hang them on rollers. There are half-a-dozen wires running across the studio at the end, and the backgrounds, provided with hooks, hang upon these; they are slidden backwards and forwards, into position, or out of it, according to the whim of the photographer.

The lighting is from the north, and there is so much of it that in summer weather blue blinds have to be exchanged for white; there is but a foot of wainscoting, the side being of clear glass, and the sloping roof of ground glass. The laboratory is in two compartments, the one for coating and sensitizing plates, and the other for developing. Everything here was in apple-pie order. M. Joliot employs the vertical dipping bath, and puts in a good plea for its use. He can cool or warm his baths with very little trouble. His bath frame has three compartments, into which you can fit three baths if you like, the baths fitting very loosely into the compartments; he, however, only puts two glass baths into them, leaving the centre compartment empty, and it is by means of this centre compartment that he maintains his bath solution at any temperature he likes. In winter, lukewarm water may be introduced, in summer time a little ice. The sides of the compartment being perforated, the temperature of the baths is soon lowered or increased. In this way he always works under the same conditions. As M. Joliot pointed out, it would be impossible to keep horizontal baths at an equal temperature by means of arrangements of such a simple nature.

In the developing room was another arrangement worthy of note. The developing solutions were kept in large glass barrels, standing upright in a row at the right hand of the assistant. Here were the iron, pyrogallic, and silver solutions ready for use, the vessels provided with glass taps, underneath which stood suitable glass measures. A handle at the left hand of the assistant further provided for augmenting and lessening the light that gained admittance into the dark room, so that he could control the illumination at any moment, and to any degree, without moving from his place.

At the Maison Lejeune the terms are: —

15 Cartes-de-Visites, plain (2 poses)	...	30 francs
15 ,, vignetted ,,	...	30 ,,
12 Cabinets, plain or vignetted ...	...	60 ,,
15 *Cartes Russes*	...	45 ,,
15 ,, cabinet size ...	...	72 ,,

During our visit, we may mention, M. Joliot was honoured with a sitting by their Royal Highnesses the Duke and Duchess of Connaught, and our kindly host was successful in securing some very good pictures of the newly-married pair, albeit M. Joliot was in sore tribulation over the Duke's portrait on account of *ses yeux bleus*.

The "At Home" next week will be Mr. H. P. Robinson at Tunbridge Wells.

PHOTOGRAPHIC METEOROLOGICAL OBSERVATIONS.

BY H. WILSON.

May I make very humbly, and therefore interrogatively, a suggestion? Would not the addition of the *exact time of exposure* to the label of each cloud negative (the process being readily ascertainable also), taken as a meteorological observation, be of great interest and utility as an index to the varying actinism of solar light in different seasons and circumstances? Would it not offer a good means of verifying or checking Dr. Angus Smith's iodide of potassium observations of actinism?

I need not, of course, remind your readers that the chemical power of daylight has been pronounced to vary considerably at different seasons, and to be especially strong in spring. It has also been said that sunstroke is a chemical effect of light, and not due to heat, and that it is more frequent in the spring. Of all this it will be interesting to know more, and the observation to be undertaken will put us on the road to further knowledge.

It would be interesting to know what part of the sky the Astronomer-Royal for Scotland photographed, and how it is proposed to point the objective in the observations about to be made.

REMARKS ON INSTANTANEOUS SHUTTERS.

BY L. WARNERKE AND J. CADETT.*

The members of this Society are much indebted to Mr. Dallmeyer for bringing forward this important subject, especially as the day is not far distant when photography will depend upon very short exposures. Expecting that the appeal made by our President at the last meeting will be largely responded to, and that many different shutters will be shown, we resolved to investigate a few points relative to "Instantaneous Shutters in General," aided by actual experiments, which may prove of importance in the present discussion.

Several forms of shutters have been in use for many years which are reputed to give very short, or so-called instantaneous exposures, but, unfortunately, the actual time of exposure has not been generally given. In consequence of the prevailing tendency to subject every fact to mathematical precision, we submitted a few shutters in our possession to practical tests, and we shall give the data and a description of our experiments.

The method we adopted was as follows:—To determine the time of exposure it is necessary to have an object moving uniformly as to time, so that the space passed by the moving object

* Read before the Photographic Society of Great Britain.

can be recorded photographically; thus denoting the time of exposure. Not having the mechanical appliances necessary for this purpose, we decided that one of us should play the part of a huge clock.

[Note by Mr. Warnerke. The choice was easy, on account of the prominence of the bump of music on the head of Mr. Cadett.] A long bamboo stick covered with white paper was uniformly moved in a circle, and to make certain of one revolution per second, a watch beating four times per second was held constantly to the ear while the stick was revolved, and so constant was the uniformity of revolution that repeated trials by photography gave the same relative results. The circumference of the circle formed by the revolution of the end of the stick was 45 feet. It will thus be seen that we had ample length of arc to measure from. The first shutter we submitted to our test was Mr. England's form of a drop shutter, working behind the lens, having a horizontal slit of 1½ inch width. With Mr. England's shutter the sky receives less exposure than the foreground; it was necessary, therefore, to give two exposures, one with the stick at the top of the circle, and the other with the stick at the bottom: these photographs which we hand round will show how these exposures are recorded. We got 1-25th of a second for the sky, and 1-15th of a second for the ground. It must not be supposed that the time of exposure here indicated is the same for all drop shutters, as the time will vary with the width of the slit, the size of the lens, and also with the amount of drop that the shutter receives before the exposure commences. In drop shutters the slit is sometimes made narrower than the diameter of the lens, with a view to shorten exposure, but it must be remembered that in any case the slit has to pass over the whole of the cone of light passing through the lens. It will thus be seen that though any individual part of the plate may get very little exposure, yet there is time for a movement to be visible on the whole of the plate; also, if the slit be narrower than the diameter of the lens, the equality of illumination will naturally suffer; it would be better, therefore, if a more rapid exposure be desired, that it be obtained by using a spring.

The next shutter tested was the form adopted by Colonel Stuart Wortley, and made by Mr. Collins, of St. John's Wood. The diameter of the exposing circle is 1¾-inch. The exposure with this shutter is of course quicker on one side than the other. In our case, the sliding movement was horizontal. The system of measurement in this case was the same as previously described, and the rapidity so shown at the centre of the plate was the 1-76th part of a second. The lens used was Dallmeyer's rapid rectilinear. The rapidity of exposure with this shutter is of course dependent on the tension of the india-rubber band. When the line of sliding was horizontal at the slower end there was 1-67th, and at quicker 1-84th part of a second's exposure.

We experimented with Harrison's Shutter (passed round for examination), but in consequence of the shaking of the camera we could not obtain reliable data. Our next experiment was made with Rouch's double flap and Cadett's pneumatic shutter. The exposure for Rouch's was 1-15th of a second, and for Cadett's 1-5th of a second. However, the rapidity in these two cases depends on personal equation, and consequently are recorded here as indicative of our own manipulation.

We are strongly impressed that information respecting the length of exposure attainable by various instantaneous shutters is absolutely necessary for each such instrument. In order, therefore, to complete the useful lesson to be derived from this evening's show, we submit to the Council of this Society a proposition to nominate a voluntary commission practically to test, in this respect, the shutters brought before the meeting, and to publish at the next monthly meeting the result of their experiments.

Our observations will not be complete without calling your attention to one point affecting the chemical details of construction of shutters. In the majority of the shutters there is generally a part to be moved to effect exposure, and this is released either by hand or by electricity, or by pneumatic pressure. In our experiments we chiefly used Mr. Cadett's principle of pneumatic pressure, and we found that by this means we could be certain of steadiness of the camera. When released by hand, no amount of care and precaution could prevent a slight movement of the camera, which resulted in giving double images. We came to the conclusion that no matter how steady the camera and stand, an electrical or a pneumatic arrangement is an absolute necessity.

If we have to give our opinion as to what is desirable in a shutter, we should say that it should be capable of being used either for very short (say one-hundredth part of a second), or long exposure (say a minute), and that it should also register the amount of exposure.

ON AN INSTANTANEOUS SHUTTER.

BY LIEUT. L. DARWIN, R.E.*

I have been asked to exhibit an instantaneous shutter designed by my brother, Mr. Horace Darwin, of Trinity College, Cambridge, both for the sake of showing the apparatus and with the hope of commencing a general discussion on the subject of instantaneous shutters. I must begin by telling you that this shutter was designed for a special purpose, and the requirements for that special purpose have alone been considered. The subject of finding the altitude of clouds came under the consideration of the Meteorological Council of the Royal Society, and it was proposed by Captain Abney that the results should be obtained by simultaneous photographs taken from the two ends of a base line of known length. With regard to the exposure of these photographs he consulted my brother, pointing out to him that the requirements were: (1) that the two cameras must be exposed by one individual; (2) that the two exposures must be absolutely simultaneous; (3) that they must be extremely rapid, and give different exposures at will. This shutter was designed to answer these requirments.

The following is a brief description of the shutter, which will be more intelligible with the aid of a diagram to be published in our next number. The apparatus consists of two distinct parts. First, rigidly connected with the lens is an electro-magnet by means of which a pin can be lifted up and down. Secondly, passing through the lens, close to the slot for the stops, are two shutters joined together under the lens by means of a spring; this spring tends to force the shutters outwards, and in the shutters are two round openings. At first no light can come through the lens; secondly, as the shutters move, these two openings come opposite to each other in the centre of the lens, and there is a full exposure; when the shutters move on to the third position the lens is again closed. This part of the apparatus is not rigidly connected with anything, and is only supported by passing through the lens; hence any movements of the shutter are not readily transmitted to the camera. In connection with these shutters are two arms with slots in them passing above the lens. The pin of the electro-magnet works in these slots; when the current passes, the pin is lifted out of a catch in the slot, and the shutters are forced by the spring into the position of full exposure. The shutters are prevented from moving further by another catch in the slot; but when the current ceases to pass they are again released, and the lens is closed by the shutters moving on. Therefore by this means an exposure of any duration can be given.

It only remains to consider whether some such contrivance might not be useful for ordinary purposes. Mr. Kirby has said that "a perfect shutter is one that will open with the greatest rapidity, remain open with full aperture of lens for the required period of time, and then shut again with the greatest rapidity;" and it appears to me that this electric shutter fulfils these conditions better than any other that I have seen. In order that a shutter may "open with the greatest rapidity," it is, of course, necessary that the whole of the opening movement should be as rapid as possible. Now this is not the case with shutters like that designed by Mr. Kirby, where the rapidity of the opening movement gradually decreases as the shutter opens, whilst it is the case with the shutter I exhibit to-night. The same remark, of course, applies to the closing. There is at present no means of regulating the length of exposure with the electrical shutter, except by regulating the time during which the contact is made. This is a loss in one way, but it is a great gain in another. This shutter, in fact, is more akin to Cadett's pneumatic shutter than to any of the instantaneous shutters yet devised; the advantages that may be claimed for it in the comparison are that the rapidity of opening and shutting would be much greater, and that the exposure is tolerably uniform over the whole field. The objection to this class is, of course, the jar, and nothing but experience, which is in this case wanting, can determine whether this is a fatal objection. The shutter could be worked by a pneumatic arrangement as easily, or more easily than by electricity.

* Read before the Photographic Society of Great Britain.

THE OXY-HYDROGEN LIME-LIGHT.

BY REV. T. FREDERICK HARDWICH.*

It is now more than twenty years since I had the honour of reading a paper before the Photographic Society of London, and hence it may be thought that I have some very important communication to make, or I should not have broken so long a silence. Such, however, is not the case; for I can lay no claim to originality in the following remarks, and my only object is to encourage the use of the lantern as an aid to teaching.

In the case of my own parish, which is in the coal-fields of the county of Durham, if I were to advertise a Bible lecture for a particular evening, I should have an audience of perhaps twenty people; but if it were added that the lecture would be illustrated by means of the oxy-hydrogen lime-light, there would be at least 200 persons present; and that not once only, but year after year, to hear the same course of lectures. I am told further, by the young especially, that they are interested in what they hear, and that the pictures assist in fixing the truth upon their memories.

Without any further apology, I proceed to make some general remarks upon the process which I have found most useful, viz., the oxy-hydrogen, or mixed gases. An impression prevails that this process is not safe for a beginner, and that it should be handled only by an expert; but with such a feeling I cannot agree. No doubt, the two gases will explode with violence when ignited in the proper proportions, but I have never been able to understand how such an accident could happen. Ordinary household gas would eventually explode if allowed to escape into a room where you were sitting with a naked candle, but before such a catastrophe could occur you would be driven by the smell of the gas to rise and turn it off. And so in the oxy-hydrogen lime-light: a passage of the hydrogen backwards into the oxygen bag would by-and-bye be alarming, but long before the danger point had been reached the lantern flame would exhibit such vagaries that your attention would be called to it, and you would put it out. The idea of the gases going the wrong way, and the exhibition of the pictures on the screen still proceeding quietly, is to my mind quite preposterous.

On the other hand, it appears to me that the preparation of the oxygen gas, as it is usually conducted, is not free from danger unless special precautions are taken. The black oxide of manganese rises with the gas, and is apt to choke the delivery tube if allowed to accumulate. Nothing worse than the bursting of the india-rubber tubing with a sharp noise has ever occurred to me; but we know by sad experience that the retort itself may give way under sufficient pressure, and that the result may be fatal. Two precautions should be taken unless a safety retort be used, viz., to see that the diameter of the delivery tube is not less than three-eighths of an inch *at any point;* and, second, to rake it out with a bent wire, and blow through it after each operation.

I also advise that in testing the purity of the oxygen before collecting it, the smouldering paper should not be held too near to the vulcanized tubing; otherwise the tubing itself may ignite, and, if it does, you will find it hard to extinguish it with the oxygen coming off rapidly from behind: even if you drop it on the floor and put your foot on it, it will still burn fiercely under your foot, and the only way to stop it will be to cut the delivery-pipe.

Another awkward accident has been known to happen at the end of the lecture, whilst the excess of oxygen was being expelled. A youth blew out a lucifer match and held it to the nozzle of the gas-bag to be relighted, when in a moment the end of the match fell off and dropped into the nozzle. It should be remembered that oxygen, although it does not itself burn, makes combustibles of all kinds burn furiously, and it would be a very disquieting circumstance to the audience, as they were leaving the room, to see a bonfire being made of the apparatus. No experiments of the kind alluded to should, therefore, be permitted.

I now pass on to consider the optical part of the lantern, which is of importance, although not to the same extent as in photography. It has been said that a good lens is wasted on the magic lantern, and that a portrait objective of even inferior quality will produce as perfect a picture as anything that can be made. With this remark, however, I can by no means agree. There are some persons whose eyes, although strong, are not accurate. If pictures are hanging crooked on a wall they do not perceive it, and if candles are quite out of the perpendicular it is lost upon them. So in a like manner with the lantern disc. I have pointed out a slight distortion of what is called the "hour-glass" kind to a group of five or six persons, and not one of them has been able to see it.

When I wrote to Mr. Dallmeyer in 1876, it was with a feeling that a really high-class instrument was needed—by the few, if not by the many—and that he was the man who had the ability and perseverance to produce it. In this expectation I was not disappointed, for as regards the lens which he sent to me, I may say that it leaves nothing to be desired; whilst the condenser gives a fifth more of light than the American Symmetrical I had previously employed, with a more truthful representation of the colours of the slide upon the screen. When I compare it with the French plano-convex condensers formerly used, the difference is even still more marked. As Mr. Dallmeyer has quoted remarks of mine in his paper read at the last meeting of the Society, it will not be necessary for me to say more at present as to the optical requirements.

In order to bring the incandescent lime into the focus of the condenser, it should be pushed inwards until the edges of the disc appear sharp and free from yellowness. The true position will be somewhat nearer to the glass than the estimated focus, according to my experience, since the radiant is a circle and not a point. The lime "spot" must also be in the axis of the condenser and objective. This will be secured by standing in front of the lantern and looking in at the anterior combination, when a bright stream of light of the diameter of a sixpence will be seen issuing forth; it should come out exactly at the centre if the lime is rightly placed. I think Mr. Dallmeyer has acted wisely in not reducing the diameter of the front combination of the objective, as the lime spot is apt to shift, and become eccentric, in which case a little latitude is an advantage. When the true focus has been ascertained, everything should be screwed up tight, so that the burner will drop into its proper place for the future, without any further trouble.

A question I am often asked is—what sized picture will your lantern produce? Much depends on the kind of slide used; whether transparent or comparatively opaque; but more still on the amount of illumination desired. I find a considerable difference of opinion in this respect, some being satisfied with a picture which others can scarcely see at all. For my own part I give the preference to *extreme brilliancy*, and consider that a picture of moderate size, well lighted, is better seen than a much larger one comparatively dull. Taking one of Doré's darker Bible subjects, photographed on a three-inch circle, as the standard, the disc (with a four-inch condenser) should be about 13½ feet in diameter, and the picture 10 feet. If I enlarge much beyond that size, I must burn more gas, or lose some of the finer details in the shadow at a distance of 60 feet from the screen.

There should be an assistant to manage the light if the lecturer is to give his undivided attention to the subject; but I have never been able myself to secure this help, and hence have been compelled to adopt certain conveniences to save trouble. The aperture of the burner is enlarged to 1-20th of an inch, and less pressure is put on the bags. Half a hundredweight will be ample with hand-painted slides, or three-quarters with the darker sort of photographs. In this way I secure a flame which will burn tranquilly, and will not require so much looking after.

The gas bags must not be filled drum-tight, if you wish to keep the light steady; otherwise the elasticity of the bag itself will increase the pressure at the beginning, and when this goes off you will have to regulate the taps. I use bags containing from seven to eight feet of gas, filling the one almost full of coal gas, and the other with as much oxygen as will be generated by a pound and a quarter of chlorate of potash, if the lecture is to last two hours. Many will deem it superfluous, but I prefer to pulverise the chlorate before mixing it with the oxide of manganese, as I find I obtain more gas, and at a lower temperature. The oxygen also comes over with greater rapidity and uniformity when the chlorate is roughly powdered.

(To be continued.)

* Read before the Photographic Society of Great Britain.

The Photographic News.

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CONTENTS.

THE BEST SOLUBLE BROMIDE FOR GELATINE EMULSION.

The choice of a good soluble bromide is more easy in the case of gelatine than collodion emulsion. Many a bromide cannot be employed in collodion, for the simple reason that it is so difficult of dissolution in alcohol and ether; thus the pure potassium and ammonium salts are scarcely to be used in collodion because of this difficulty. With the aqueous gelatine emulsion, however, it is different, for most of the bromides dissolve in water.

The bromides of the heavy metals, which are preferred for collodion emulsion because they dissolve with the least difficulty in alcohol and ether, should be avoided in the preparation of gelatine emulsion. Long experience has shown that salts of this nature act upon the gelatine, and, as in the case of zinc, rob the emulsion of its setting properties if the process of digestion is continued for any length of time; and as bromide of zinc has recently been recommended for the preparation of gelatine emulsion, we may be permitted to say that, in our experience, emulsion prepared with this salt possesses no advantage over that made with the bromides of ammonium or potassium.

Most experimentalists employ bromide of ammonium, and with this salt excellent results are secured. In fact, one would scarcely think of replacing it were it not for the fact that bromide of ammonium absorbs moisture very readily, and that on long keeping it changes colour; moreover, it decomposes after boiling in water for some time or with certain classes of gelatine, giving off ammonia the while. By employing bromide of potassium these little difficulties are avoided. The fine large crystals are not attacked by moisture, and, unlike the finely-powdered ammonium bromide, the salt may be weighed and used without any previous drying. But ordinary commercial bromide of potassium, unfortunately, has generally an alkaline reaction, for it contains potassium carbonate, and alkali, as we know, is apt to decompose the emulsion on digestion, and to beget fog. Commercial bromide of ammonium, on the other hand, has always an acid reaction, and does not, therefore, give rise to this difficulty.

This is the reason, we feel sure, why many do not get good results with bromide of potassium, and are better pleased with the ammonium salt. The alkaline reaction is, indeed, injurious in all cases where the highest sensitiveness is sought by simple digestion at a warm temperature, and not through the addition of ammonia.

By working, however, with a neutral or only slightly acid bromide of potassium, an equally good emulsion will be obtained as with the ammonium salt, while the former, as we have said, is more stable and, at the same time, more convenient to handle. True, it has been stated that the resulting bromide of silver is not in so fine a state of division as that secured by the use of ammonia salt, but this statement, we hold, requires confirmation. So far as we have been able to make out with the microscope, the particles are in both cases equally fine; but we may mention that there is some difficulty in measuring, since their diameter did not, apparently, measure as much as 0.0007 of a millimetre.

The commercial bromide of potassium, which, as we have said, is frequently alkaline, may be easily made available for photographic use by slightly acidifying it with hydro-bromic acid or acetic acid and re-crystallizing; or the salt may be employed in the form of a solution. But neutral bromide of potassium may also be purchased on application to any manufacturing chemists of standing.

INSTANTANEOUS SHUTTERS.

We recently referred in our columns to some points connected with instantaneous shutters, but we return to the subject, as a few further hints to inventors in this branch of mechanics will not be out of place. As a rule, instantaneous pictures are taken with the full aperture—or, at all events, very nearly the full aperture—of the lens, and for our purpose we may consider the former case. A full aperture means practically that every part of the lens does its work upon the sensitive plate. If we now consider what will happen when a drop shutter is used just behind the lens, as in England's new shutter, we shall see that the full benefit of the short exposure is not given. Placing such a shutter in the position indicated, and gradually lowering it by hand, we shall find, on examining the focussing screen, that when a very small part of the top of the lens is uncovered, very nearly the whole of the image is visible on it, and that this continues visible till very nearly the whole of the lens is covered. This is the first point; but now, if the same procedure be adopted, another point will present itself. The image at first is very badly lighted, then becomes very bright as the whole of the lens is uncovered, and finally becomes weak again as the lens becomes nearly covered up. Putting these two observations together, we arrive at the conclusion that the position of the drop shutter is not the best for giving definition. Roughly speaking, we have the whole of the image exposed, whilst the aperture in the drop shutter is passing over the lens, or, in other words, the real time of exposure is prolonged, whilst the light striking the plate is at first very feeble, then increases, and then diminishes again. Now the time for a shutter with a 2-inch opening to fall past a lens of $1\frac{1}{2}$-inch diameter is something like 1-7th of a second, and any movement which takes place in that interval in any part of the picture must be chronicled. By placing the drop shutter near the plate it will be found that about the same exposure to the two inches of the top part of the plate would be given, but then there would be a vast difference in the total time of exposure. For instance, with a whole-plate the shutter would have to fall about $8\frac{1}{2}$ inches before the whole exposure was complete. The second two inches of the plate would receive an average exposure of about 1-27th of a second, whilst the third two inches would have about 1-35th of a second. Now a little calculation will show that 1-35th of a second with the full aperture of the lens is equal to about 1-7th of a second with the lens gradually diaphragmed off. The second two inches down the plate where any moving objects are likely to be found has only about 1-27th of a second's exposure, and yet the illumination is about five times that when the drop is behind the lens. If 1-10th of a second is found to secure sufficient sharpness in the moving objects with the inaccurately-placed shutter, the same can be obtained by using a shutter in front of the plate which has an opening of more than four inches, since that length of drop would take 1-10th of a second to fall over the second two inches from the top of the plate. We would, therefore, impress upon photographers the necessity of making up their minds as to what exposure they really do require, and then see if it cannot be secured by moving the shutter, at all events, away from the lens and towards the plate.

Notes.

We announce, with deep regret, the death of Mr. W. W. Stoddart, F.C.S., F.G.S., the President of the Bristol and West of England Amateur Photographic Association.

The Royal Cornwall Polytechnic Society advertises its annual Exhibition, at Falmouth, for the last day in August, and photography, as usual, is to occupy a prominent position therein. An announcement in our columns apprises intending exhibitors of the distribution of "medals and prizes in the mechanical, fine art, photographic, and other departments.

We visited the Polytechnic on Tuesday to see the "series of specially prepared photographs" of Scottish scenery that serves to illustrate Mr. Malden's lecture. The screen at the Polytechnic measures nearly thirty feet in height, and it is always a pleasure, therefore, to see good photographs on this scale.

Unfortunately, the pictures shown are not all good ones. Nothing could well excel the grand photograph of the Trossachs, the massive foliage in the foreground contrasting with the towering mountain range beyond; nor that of the pastoral Loch Lomond, and of the big rock in the pass of Killiecrankie, known as the Soldier's Leap. Again, John Knox's house in old Edinburgh, and York Minster, with which the series begins, are graphic in the extreme, and alone worth a journey to Regent Street to see.

But some of the transparencies are decidedly muddy, and the waterfalls in one or two instances spoilt by lavish painting. The films in cases were so dark that they must have certainly been printed in silver. Surely, when it is seen how good results are obtainable, it is not very difficult to regulate the printing. With carbon or Woodbury printing, transparencies of any desired delicacy are to be secured. The pictures of Iona with its cathedral, where lie buried Macduff, Macbeth, and forty other Scotch kings, would have been much improved by better printing. But to judge by the gigantic tear-drops (defects in the glass) that appear on the Crinan Canal picture, and another of the series, no extraordinary care has been spent over the "specially prepared photographs" at the Polytechnic.

Mr. Pouncey's new process, of which several accounts have already transpired, appears to resemble the methods of producing coloured photographs to which we reverted the other day. A groundwork of colour is covered by a photographic impression, or the colour is laid upon one photograph and covered by another. His pictures are finished with a good deal of skill, and thus appear to point to the conclusion that the colouring is done by hand. Mr. Pouncey keeps the manipulative details a secret, as it is his desire, we believe, to form a company for working the process, which presents several features of considerable ingenuity.

Inventions, like comets, are in the habit of turning up afresh at stated intervals, as witness that never-ending subject for the Patent Office, "the application of colour to the back of the photograph," which has given rise to so many startling newspaper reports on photography in natural colours. One would have thought, at any rate, that the interesting experiments of Mr. Warnerke and Lieut. Darwin in the application of phosphorescent powders to photography were quite new, but, judging from the following extract of a letter from Niépce to his son, it will be seen that these gentlemen were forestalled by no less a personage than Daguerre himself. Here is the document in question, written by Nicéphore Niépce on the 4th September, 1827, after an interview with Daguerre: "The chemical composition employed by Daguerre is a very fine powder which does not adhere to the surface on which it is spread, and must therefore be kept horizontal. This powder, on the least contact with light, becomes so luminous that the camera is quite lit up by it. This substance, as far as I can remember, is very analogous to sulphate of baryta (cauk) or Bolognese stone, which also has the property of retaining certain prismatic rays."

A hint in painting backgrounds. Mr. Frederick Piercy suggests the employment of a little brown sugar in distemper painting, which is added to the size solution. One of the difficulties experienced in distemper painting is that the colour dries so rapidly on the canvas, and before you have well time to manipulate; the addition of sugar allows you to work as leisurely as with oil.

The result of examining several samples of high class gelatine is this: that the transparent qualities contain traces of hydrochloric acid, while the turbid gelatine is generally free from this defect. Gelatine plate makers, as a rule, prefer the former, because of its transparency, and not, of course, by reason of the acid character.

Obviously, hydrochloric acid would at once tend to the formation of chloride on the addition of silver salts; we must either suppose, therefore, that the amount of acid in the gelatine is too small to be material, or that the chloride acts beneficially in conjunction with the bromide and iodide of silver. We have never heard of chloride of silver being specially introduced into emulsion, but it is certainly present in small quantity in many of our gelatine plates.

We see that the *Illustrated London News* publishes two pages of sketches from the Cromwell House Tableaux Vivants, taken from photographs secured at the time of the entertainment. Photography at evening parties is evidently taking the place of conjuring. The pictures in this case were taken by electric light, through Mr. Vander Weyde's agency, and Mr. Samuel Fry, who had much to do with the success of the undertaking, brought with him, as a matter of course, a supply of his own plates for the purpose.

Topics of the Day.

ON THE MODIFICATION WHICH GELATINE UNDERGOES THROUGH LONG CONTINUED HEATING, AND THE EFFECT PRODUCED THEREBY ON THE BROMIDE EMULSION.

BY DR. J. M. EDER.

In order to render the gelatino-bromide of silver very sensitive, it is generally maintained for a long period at a moderately high temperature (30° to 40° C.) During this process a change in the composition of the gelatine sets in, the visible sign of which is that it loses partially or entirely its capability of solidifying or setting, a phenomenon that I may perhaps investigate at greater length on another occasion. The question then arises, does this change or decomposition react on the silver bromide?

Dr. Lohse, in the *Photographisches Archiv*, maintains that gelatine (he speaks of it in general) kept for a long time at a temperature of 30° C., with or without the access of atmospheric air, gives off at the end of four days fumes of ammonia, and that in seven days it has a powerful alkaline reaction. He points out that this spontaneous development of ammonia must have the same effect as the ammonia which is purposely added to the emulsion in order to increase its sensitiveness. Hence arises a reason to believe that probably, with long-continued emulsification, the production of ammonia is the only cause of the enhanced sensitiveness. This conclusion, however, would hardly be warranted, inasmuch as Lohse's experiments are defective; he experimented with the gelatine of only two different makers, and the inferences which he draws are therefore not entirely correct.

For this reason I have myself tried the following experiments:—Twelve different kinds of gelatine, among them those of Nelson, Coignet, Creutz, Heinrichs, Fischer, and Schmitt (the last named being German manufacturers), were dissolved in water, and kept for fourteen days at a temperature of from 40° to 50° C., at which temperature gelatine is most apt to putrefy. The initiatory reaction was alkaline only in two of the sorts, those of Nelson, and of Fischer and Schmitt; these gave off ammoniacal fumes at the end of from three to four days, and indeed we ought not to be surprised at it, inasmuch as any kind of gelatine when heated with an alkali produces ammonia. Of the gelatines possessing an acid reaction, all maintained their acidity after eight days' digesting, and gave off no ammonia; only one on the ninth day lost its acid reaction, and then in two days more developed fumes of ammonia. All the others remained acid, and indeed possessed a most powerful acid reaction.

All the samples of gelatine, however, contained ammonia in combination, and this escaped at once on the addition of potash solution. According to Nencki, the ammonia is combined with acetic, butyric, and valerianic acid, which, together with glycochol and peptones, are formed when putrefaction takes place. This decomposition is set up by the fermentation organisims of the atmosphere, which under certain circumstances are capable further development without access to the air, though in that case the process of putrefaction takes six times as long a time to accomplish (Jeanneret).

My own experience is that silver bromide can be digested for several days in a neutral or slightly acid solution of gelatine kept for several days, without decomposing, though the silver bromide is converted into its most sensitive modification, a proof that the spontaneous development of ammonia is not necessary to produce this state. In the presence of a small quantity of ammonia, the silver bromide quickly assumes the sensitive condition, but in a few hours decomposition is set up, and the plates will show manifest signs of fogging; this occurs more especially when the temperature is raised above 50° C.

It follows from this, that the secondary effects (mostly decomposition) of a long digestion of gelatine at a high temperature only appear when that substance has an alkaline reaction at the outset. When, however, as recommended by Van Monckhoven, an emulsion is prepared with the intentional addition of ammonia, both alkaline and acid gelatines will behave in the same way, for in this case the alkaline reaction has been brought about purposely, and is therefore taken into consideration.

The Topic for next week will be "Protection against Forgeries—Photographic and Otherwise," by John Spiller, F.C.S.

FRENCH CORRESPONDENCE.

Photographic Guide to Advertising—Woodburytype Impressions on Transfer Paper—Production of Photographic Enamels—Method of Regulating the Velocity of Instantaneous Shutters—Legal Decision on the Artistic Copyright in Photographic Works.

Photographic Guide to Advertising.—One of our best known advertising agents, M. Emile Mermet, has adopted the plan of illustrating a work which is about to be published under the name of *Guide-Manuel de la Publicité*, with phototypes (reduced) of a number of journals. He takes a reduced photograph in the camera of the first page of each journal —from which its title and general aspect is best observed— and transforms it into a printing plate by means of zincography with bitumen. Turning over the leaves of this interesting publication, I have observed more than eighty of these illustrations, most of them admirably executed. This appears to be a very happy application of photography; thanks to it M. Mermet is able to give in his book a very good idea of a large number of journals, whose title, form of type, general aspect, &c., can be easily appreciated with the aid of a good magnifying glass, even by those who have not good sight. The press and manufacturers in general will feel thankful for the information afforded by this little work, in which will be found combined all the means for comparing with one another the various journals and publications of the day as regards the advantages they offer for advertising purposes; it will also be the means of making known many periodical publications whose opportuities for affording publicity might have been overlooked. I think I am only doing my duty in drawing attention to this novel use to which photography is applied, and to the services it is capable of rendering to all persons engaged in business.

Woodburytype Impressions on Transfer Paper.—As a consequence of the new method recently invented by our ingenious colleague, the Woodbury process is the order of the day. Every one now knows in what this new method consists; but it scarcely seems to strike any one how many interesting applications it is susceptible of. I am not able now to draw attention to all these, but I shall return to the subject on a future occasion. What surprises me is, that so little use is made of the power the new process affords of transferring directly the impressed pellicle to its permanent support, without being compelled to take a print on paper, and then to mount this paper on cardboard. The most appropriate transfer paper is ordinary gum-lac paper, but not emulsified with milk; it must be perfectly glazed. It is better to substitute, for the operation of emulsifying with benzoin, a slight varnish of wax laid on with a rag. By this means the paper on which the impression is taken has very little hold on the image, and the latter can be transferred with ease to any surface that may be desired. In this way photoglyptic prints can be mounted on sheets with margins without being inconvenienced by a double thickness of paper. To facilitate the transfer it will be well to coat the image, while it is still on its temporary support, with a thin film of gelatine; but as the oil used to grease the mould will prevent this film from adhering, the surface should first be

powdered with *Sommière's* powder, which will absorb the oil, and enable the gelatine to cover completely the whole printed surface.

Production of Photographic Enamels.—The same may be employed for the production of a transferable image, holding in suspension a colouring material in the shape of a finely pulverised metallic oxide. In this case, instead of gelatine, must be used a fatty substance, which melts when heated, and solidifies and hardens on cooling, like wax, for instance. This substance must be rubbed, or, still better, mixed in a warm state with the metallic oxide. The impression will be of the same kind as in the gelatine process, and the form of the temporary support need alone be modified. The latter should be covered with some impervious coating which is soluble in water. The transfer of the image is then easily effected by wetting the back of the print. Mr. Woodbury's new process lends itself to a large number of other applications, simplifying, as it does, the machinery employed. I hope to be able to give a detailed and, I trust, interesting account of some of these in a future note.

Method of Regulating the Velocity of Instantaneous Shutters.—In my last letter I gave a description of the method adopted by M. Jubert for measuring, by means of a counterpoise, the length of the exposure with his instantaneous shutter. This was on the same principle as Atwood's machine; but there seems to me to be another method, which leads more directly to the result sought to be obtained. The method I advocate would depend on the employment of a clock with a hand marking one-sixtieth of a second. The start of the hand and of the shutter must take place simultaneously, being regulated by electric contact, and on developing the sensitive plate the number of sixtieths of a second marked by the hand of the clock would be determined. In this way a series of weights corresponding to the fractions of a second could be found. I see with great pleasure that this important question is being thoroughly investigated in England. It is really urgent in order to be able to work with the present rapid gelatino-bromide plates with sufficient accuracy, and the only way to accomplish a correct result is by employing instantaneous shutters whose length of exposure can be properly measured.

Legal Decision on the Artistic Copyright in Photographic Works.—Although the English law of artistic copyright in general, and of the copyright in photographs in particular, is different from that which prevails in France, it may nevertheless be of interest to some of my readers to have an insight into the principles which govern this question among us. A photographer who has been in the habit of copying portraits, of which the originals were published by Messrs. Franck and Truchelet, has been cast in a lawsuit, the grounds of his defence being—(1) that photography is not an art; (2) that the portraits only had been produced by the plaintiffs, but the grouping had been effected by himself. As regards the second of these points, the judge would not admit that there existed a right to make a copy simply because the copying was avowed. On the first point the following judgment was delivered: "Granted, that in the production of a photograph, which is incontestably allied to the Fine Arts, mechanical means of execution and chemical reagents have had a considerable share, it is nevertheless certain that the individuality, the taste, and the more or less artistic perception of the photographer interpose and make themselves felt, either as regards the manner of grouping and lighting the objects to be reproduced, or as respects the arrangement of the mechanical apparatus, or as intelligently directing the chemical operations, so as to modify and regulate the general effect of the image obtained on the plate. . . . . . There is, therefore, every reason to place photographs on the same footing as drawings and engravings, the copyright of which is protected by the law of the 17th July, 1793, and the defendant is condemned to pay damages and costs." This judgment has at the present moment very great importance in France, since efforts are now being made to obtain a new law of artistic copyright, from which, if possible, photography shall be excluded, especially as several of the members of the Commission appointed to draw up the law are strongly of opinion that photography is not a Fine Art. LEON VIDAL.

A FEW REMARKS ON THE WORKING OF GELATINE PLATES IN THE STUDIO.

BY FRANK P. MOFFAT.*

In reading a paper before you tonight I do it more with the object of promoting a discussion on the present all-absorbing topic to photographers of gelatine plates than in the hope of being able to impart any new imformation on the subject.

Gelatine and collodion plates differ so entirely that I do not think it possible to use them satisfactorily together. In the first place, two dark rooms are required, but of course that is not an insurmountable objection. Secondly, the exposures are so widely different, and do not always bear the same relative proportion to each other. I mean that on a bright day a collodion plate will be more rapid, in proportion to a gelatine one, than it would be on a dull day. I think the whole secret of success in gelatine plates lies in the correct exposure, with which one must be very exact, because when it consists of three seconds, one extra second more or less makes a very great difference; and, if gelatine and collodion were being used promiscuously together, the difference in the exposure would be very apt to get one into a complete mess. Lastly, the appearance and requisite density of gelatine negatives after they are fixed are so entirely different from collodion ones that it would be most difficult, if not impossible, to have the eye trained to judge negatives by both processes at once. I will now briefly describe the way I expose and develop a plate.

Before placing it in the slide, dust it lightly with a camel's-hair brush. When exposing, be very careful that the camera is light-tight; and to ensure its being so I always cover it completely with the dark cloth, allowing it to cover the lens as far as the slit for the diaphragm. I always develop with pyro, as it allows a margin in development; that is to say, if a negative be under-exposed, begin with a small quantity of pyro, and a large quantity of ammonia, and *vice versa.*

The developing formula I use is as follows:—

Liquor ammonia...	1 ounce
Bromide of potassium	1 drachm
Water	2 ounces,

which solution is kept in a dropping-bottle. When about to develop a half-plate, place it in an ebonite tray half filled with water. Put about three grains of dry pyro into a two-ounce cup and fill up with water. Throw away the water in which the plate is steeping, and pour on the pyro solution, then put into the cup eight drops of the ammonia-bromide solution, bring the pyrogallic solution back into the cup, and then pour the mixed solutions on to the plate again, when, if correctly exposed, the image will appear rapidly. Should the high lights come up out of proportion to the shadows, drop some more of the ammonia-bromide into the cup, pour back the solution from the developing tray, and again flow over the negative. This can be done several times until the shadows are quite out; but one must always bear in mind that one extra drop to begin with is worth five after the image has begun to appear. On the other hand, if the image come up flat and over-exposed in appearance, pour away the solution and dissolve some fresh pyro, only adding two or three drops of ammonia, which will cause the high lights to attain the proper amount of density without over-developing the shadows. I immediately after pouring the developer over the plate take a camel's-hair brush, which should be kept soaking in a dish of clean water near the developing trough, and gently brush the plate all over, which removes any air-bells or dirt which may be on the plate. To get clean negatives one requires to use a brush at all

* Read before the Edinburgh Photographic Society.

stages before placing in the slide, while developing, after washing, and before varnishing. This causes very little trouble, and tends greatly to the cleanliness of the negatives. After the plate is developed and washed, place it in a strong solution of alum for a minute, then wash and place in the hypo, where it ought to remain for a quarter of an hour. Now wash it thoroughly under the tap, and place it in running water for one hour; then wash under the tap again, this time using a brush, sweeping it lightly over the surface of the plate. This takes away all traces of hypo, should any remain, and clears away any dirt which may have adhered to it while in the running water.

Should a plate begin to frill—which sometimes happens when washing, after taking it out of the hypo, owing to its not having remained long enough in the alum—at once place it in a dish of methylated spirits, and allow it to remain a few minutes; then, without further washing, place it in a rack, and wash it after it is dry.

The great difficulty in working gelatine plates is to judge, while developing, the proper density. If the plate be correctly exposed the requisite density is obtained when the image appears faintly on the back of the plate; but if it be in the least under or over-exposed, this guide is of no use. One old photographic amateur told me he could never see the image at all, so he always counted a certain number while developing, and then washed the developer off. This would be a very good plan if you were always sure of the exposure, but, for my part, I prefer to see what I am doing. It is only by practice one is enabled to judge the proper density. The time the solution has been on the plate must be taken into account; for the longer the solution remains on the plate the denser it will be. If a negative come up dense quickly, although it may appear denser than another which has undergone a prolonged development, it will come down in the hypo very much more.

However, should a negative be found too dense when dry, place it in a dish of water and allow it to soak for at least an hour; if not properly soaked it is apt to reduce unevenly. After soaking, place it in a dish containing a weak solution of perchloride of iron of the colour of pale sherry, and let it lie there until sufficiently reduced, when, of course, it requires to be washed. It should not be rocked at all while in the perchloride, as that has a tendency to reduce the shadows without the high lights, and causes it to become worse than it was at first. To intensify a thin negative I use a formula given by Messrs. Wratten and Wainwright in the pamphlet which they issue with their plates. The following is a copy of it:—

"A.

Protosulphate of iron	15 grains
Gelatino-acetic acid solution (as described below)	40 drops
Water	1 ounce

"B.

Nitrate of silver	10 grains
Glacial acetic acid	10 drops
Water	1 ounce.

"The gelatino-acetic acid solution is compounded as under:

Gelatine	15 grains
Glacial acetic acid	3 drachms
Water	5 ,,

"It is as well to prepare a stock of this, and also of 'A,' as they are both better for keeping.

"First flood the plate with water, and then with a solution of iodine and iodide of potassium of the colour of pale sherry for one minute; rinse it off and apply enough of 'A' to cover the plate for the same time. Now drop into the cup a drachm of 'B,' and bring the 'A' back from the plate to the cup to mix them together. Re-apply, and keep moving over the surface until density is sufficient. If any air-bells should occur they must be kept moving, and then they will do no harm."

That is their formula, and I have only one thing to add, which is that the plate must be thoroughly well washed under the tap, after it has been intensified, until all signs of greasiness disappears; otherwise the film has a tendency to become of a mottled appearance.

All I have said tonight has been written over and over again in the journals and elsewhere, but I must excuse myself on the plea that I have really nothing better to bring before you.

Correspondence.

PAYMENT OF ASSISTANTS.

Sir,—There has been a good deal lately written upon this subject once more (for, as you must know very well, this is not the first time that the subject has been aired), and, as far as I can see, as little good will come out of it.

One party has accused me of not giving practical advice; another has impaled "J. Kay" and myself as being parties who thought we had only to ask for a rise, and we would get it. I beg to suggest that they are both wrong as regards myself; as I briefly informed the "Six Year Man," in my last letter, it is the employers who ought to be the best judges of the assistant's money value. That is practical enough; yet is there a flaw. An employer who has a thoroughly good man—a man who has satisfied his employer and customers at the same time—a man who, we will say, received a salary of from £2 2s. to £2 10s. per week (country, I allude to, in the general acceptation of the word) and this for years; he has seen the business increase; and he naturally looks for a little more remuneration for his increased services, seeing that his employer does not think fit to engage an extra hand. What is the upshot of this assistant's reasonable demand? His employer looks at the photographic papers, and sees that first-class men, well versed in every department, are open to engage at even less money than what he pays his present artist. Now here comes the pull. Human nature is human nature all the world over, and if you can get a cucumber at sixpence in one shop, whereas you are charged one shilling for it at another, you are certainly bound to make a trial. What is the result? You execrate the sixpennyworth, and go straight for the shilling one. Then if it is sold, it serves you right. I shall go no further with my metaphor—"he who runs may read."

I mean briefly to say that the low estimate of assistants' wages lies within their own hands; if they are underpaid it is their own blame. They advertise themselves as first-class artists, when they are only fit to "coat and clean plates" like the "Six Years' Man." Directly a good man wishes for a reasonable rise in his salary, there comes a cloud of applicants, that nearly drives the poor employer mad. When he has to change his assistant every month, the business, as a rule, does not increase.

By-the-bye, what on earth does the man mean by asking how he is to learn the business? I was never apprenticed, but that was in the long ago, when the art was very young; I may honestly say that I picked it up. I worked perseveringly; with innate determination, I overcame all difficulties (sometimes I think I have worked more for others than myself), but still my love for the profession, and my wish to excel in it, have kept me pretty well to the front. I have stuck grim to hard work for years upon years—very few holidays for me! And in this brief recital, the man of "Six Years" will know the practical way that the art was learned.—Yours, &c., Beau Nash.

STRIPPING GELATINE PLATES.

Sir,—If "Amateur" will cover his gelatine negative with a piece of sheet gelatine, and, when dry, pour on a film of collodion, the glass will not only separate in acidified water, but his negative film will have plenty of body.—Yours, &c., Another Amateur.

Sir,—For the information of your correspondent, "Amateur," I beg to say that providing the film be a good one, there will not be the slightest difficulty in transferring it. It is a thing that I do almost every day, and in those days, now happily past, when frilled films were so common, I did it very frequently.

Only a day or two ago, when testing the printing qualities of a negative, the glass cracked, but left the film un-

injured. I laid the negative in water for an hour, then ran my finger-nail all round, cutting through the film. Then began at one corner to roll off the film with the finger. With ordinary care and patience it will come off perfectly.

When I had a case of frilling, I frequently stripped off the film and so saved the negative, but occasionally lost a picture through the tenderness of the film; now, however, with plates of my own making this never occurs, owing to a very tough gelatine being employed. The advantage of such tough films for carbon printing is very great, as a reversed negative can be made without the least trouble.

THOMAS B. BLOW.

"LOOKING BACK."

DEAR SIR,—I was much pleased at reading the papers which have appeared in your columns from time to time, entitled "Looking Back," and now write to suggest that those papers should be issued in book form.

Such entertaining sketches are, I think, well worth making a small book of, say a shilling edition. If you hold the same opinion, and will kindly publish this note, a pleasant and readable little book might be the result.—I am, sir, yours, &c., J. STREATFIELD COX.

Proceedings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held on Thursday evening, the 27th ult., at the Free Library, William Brown Street, Mr. J. H. T. ELLERBECK, President, in the chair.

The minutes of the last meeting having been read and confirmed, Mr. G. H. Boroughs was elected a member of the Society.

An exhibition of negatives and prints taken at the last excursion to Haughmond Abbey and Shrewsbury then took place; and the pictures were, almost without exception, exceedingly good. Special commendation was elicited by Mr. Tyrer's 12 by 10 print of the Norman door at Haughmond; by Mr. Boothroyd's picture of the old barn and its surroundings; by Mr. Wood's instantaneous view of the ferry on the Severn; and by the groups by Mr. Weber and the Secretary. The exhibitors were the President, the Secretary, the Treasurer, Dr. Kenyon, and Messrs. Tyrer, Weber, Wood, Bruce, and Boothroyd. The gelatine process was well to the front on this occasion, since of the hundred and fifty negatives taken, one only was a collodio-albumen plate, and all the others gelatino-bromide.

A discussion took place on the subject of the best developer for dry plates, with reference to portability.

Dr. KENYON spoke of the advantages in this respect of the new combination of oxalate of potash with sulphate of iron.

The SECRETARY thought that nothing could surpass, as regards portability, the use of concentrated solutions of pyrogallic, and of ammonia and bromide.

The CHAIRMAN exhibited some good negatives taken upon Solomon's new "wundershönen" plates.

A discussion then ensued on the time and place for an outdoor meeting in the month of June. Thursday, the 17th, was fixed for the day, and Ruabon and neighbourhood for the place. Dr. Kenyon was requested to act as *cicerone*.

The meeting was then adjourned to the last Thursday in June.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

ON Wednesday, 26th inst., the members of the above Association, at the invitation of one of their members, Rev. H. B. Hare, spent the day at the village of Great Elm, near Frome. The valley in which Great Elm is situate is positively full of the most charming subjects for the camera, the river which meanders through its natural beauties enriching it at every turn. Not being one of the Association's regular out-door meetings, all the usual formalities were dispensed with, and the members met at Temple Meads Station, Bristol, to proceed by the 7·55 a.m train to Radstock, where a break was in waiting to drive the party to Great Elm.

The general character of the scenery on the route is particularly fine, so that the drive was much enjoyed. On arriving at the village of Mells, some old cottages and a view of the river compelled some of the members to alight and "shoot off" a plate, which was easily done, it being understood that all would work dry processes.

After having continued the drive some little distance, the worthy host, Rev. H. B. Hare, and the Hon. Secretary, Mr. H. A. H. Daniel (the latter of whom had preceded them the previous evening), were encountered; they having joined the party, the drive was brought to a close by the break pulling up at the entrance of the Rectory, where commenced the thoughtful and painstaking kindness which characterised Mr. Hare's arrangements during the whole of the day.

A kind of late breakfast, or early lunch, kept all at work for a few minutes, but no time was allowed to be lost, a reminder being given that real work had not yet commenced. The morning was as still and fine as any photographer could possibly desire, with just sufficient light fleecy cloud to cause everything to appear brilliant without the slightest tendency to hardness.

A start was at once made for Hapsford, a beautiful estate close by, through which the river runs, which, with the natural and artificial beauties adjacent to it, furnished the first real group of subjects which had received general attention.

The valley being gained by an exit at the opposite side of the estate, a picture which caused general enthusiasm was met with, viz., a beautiful wooded piece of road-side with a cart and team of horses emerging from a quarry, the background being made up of choice and varied foliage. A few copper representations of our gracious Majesty at once put "the captain of the team" in good trim, the horses and cart were drawn into the most picturesque and favourable position, and cameras were at once put into thorough requisition. We have since heard that some of the negatives of this very rural scene have come out very satisfactorily. Here our host (who had come with a fishing-rod, to try and make himself useful and ornamental in suitable positions in some of the pictures) profitably occupied the time by hooking a very respectably sized trout.

The walk was continued for a short distance, when an old rustic bridge with a bold foreground of stumps and shrubs occupied the attention of the peregrinating party, and at this point of the ramble the genial face and "ever-new yarn spinning" nature of one of the Vice-Presidents, Mr. T. Davey, made its appearance on the scene, he having been prevented from arriving by the first train. Mr. Hare still pressed on, knowing well what a number of fine studies still remained for his guests to essay the reproduction of, and another halt was soon made at the "Wishing Tree," most eccentrically shaped and noteworthy specimen, which our host informed us was instrumental in the most responsible and important operation of procuring ladies husbands. At this point in the proceedings a singular discovery was made; the Hon. Secretary, with his 10 by 8 camera, proportionately large changing-box—in fact, "the whole bilin' of them"—were missing. Some asked very suspiciously whether an artist's umbrella, seen some distance back through the valley, shaded a lady artist, but on this being conclusively decided in the negative, all experienced a decided relief to their feelings, the original fear being that probably "the Wishing Tree" forgot or exceeded its duty in some extraordinary mode or other. A special messenger was, however, despatched to discover the missing Secretary, but without success.

Lunch time had now arrived, and the members were asked to return to the Rectory to "refit;" on arriving there the Hon. Secretary was discovered in the act of coolly enjoying a cigarette, at the same time cherishing a happy and expectant sensation of complete readiness for the next operation. After some facetious enquiries after the "young lady under the umbrella," it was elicited that Mr. Daniel, after missing the rest of the party, had lost his way, and not desiring to lose his lunch too, had determined to "be in time."

Lunch having been commenced, with the hospitable host presiding, and the vice-chair in the occupation of Mr. Daniel, the heat of the day quite compelled the use of the "wet process;" such large quantities of developer seemed necessary to the perfect development of the images (by no means lay figure) that "Mr. Hare thought it might remove any feeling of anxiety in the minds of his friends if he stated that he had two thirty-six-gallon casks of this special preservative developer on tap." The Hon. Secretary since states that it was wonderful to note the ease with

which great density was attained. On the conclusion of lunch Mr. Daniel said that he felt sure what he was about to say would meet with universal approbation; he had told the members at the last meeting how greatly they would enjoy the beauties of the valley, and he knew one and all had done so up to the present far beyond their expectations. The whole of this, the hospital spread they had just sat down to, and every single item of the day's enjoyment, was afforded them through the great kindness of their friend Mr. Hare, and he knew he should be simply acting as their spokesman in cordially and without ceremony proposing a most hearty vote of thanks to him for his hospitality and thoughtful efforts to make the day so enjoyable.

Mr. T. Davey said it was with the greatest pleasure that he seconded Mr. Daniel's proposition. As far as he was concerned, he had experienced the utmost pleasure in the whole day's proceedings, and it was a day that would live a long time in his memory on account of its perfect enjoyment. He was very glad to have the opportunity of seconding the vote of thanks to their host for so kindly entertaining them.

As the curls of fragrant smoke ascended from the various forms of weed. on the conclusion of lunch, a move was again made, and the stroll being resumed a great many more plates were exposed, exclamations at the universal beauty of the district being very frequent. Time and tide wait no man, and trains not very often, so that as six o'clock approached a return to Mr. Hare's residence was made, where he once more set his friends to work in sustaining their inner man, after which, with mutual good wishes as to the results of the plates, the drive to Frome was commenced, and as a shower of adieus left the break, a curve in the road hid from view the kind friend who had arranged a day of pleasure which all regretted had passed so quickly. Every member present worked, the sizes ranging from 4¼ by 3¼ to 10 by 8, and a large number of plates were exposed. The return railway journey was pleasantly made, anecdotes, discussions, and the fragrant weed pleasantly whiling the time.

Talk in the Studio.

Photographic Society of Great Britain.—The last meeting of this Society for the present session will take place at the Gallery, 5, Pall Mall East, on Tuesday next, June 8th, when papers will be read by Captain Abney, R.E., F.R.S., on "Aids in the Working of the Gelatino-Bromide Process," and by T. Bolas, F.C.S., on "The Reproduction of Negatives in a Reversed Direction by the Inverse Action of Light on Gelatine Plates;" also the adjourned discussion on "Instantaneous Shutters" will be resumed, and an opportunity given for the exhibition of any other new ones.

Obituary.—By the death of Mr. W. W. Stoddart, the President of the Bristol and West of England Amateur Photographic Association, scientific men in general, and photographers in particular, lose a staunch and worthy comrade. His reputation in Bristol may be gathered by the prominent position he was called upon to occupy, while as the city and county analyst his name was a household word throughout the west country. Mr. Stoddart was a Fellow of the Chemical and Geological Societies, an indefatigable worker, and a sound chemist; indeed, his attainments and industry seem to be responsible in a measure for his somewhat sudden death, for besides his laboratory work at Bristol, his attendance and evidence were frequently called for in every corner of the county. "I have only had one evening at home in two months," he said to a friend shortly before his death—the plaintive speech, surely, of an over-worked man. But it is the Society of which he was president that will feel the loss most keenly of his kindly and unassuming presence, his generous sympathy, and his hearty encouragement. As one of the members says of him very truly: "As a Society we have lost a true friend and a great teacher, and noble undertakings and institutions have been deprived of an energetic helper."

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

Oxalate.—The little picture you send is very perfect, the fine lines of the shipping, both far and near, and the tremour of the rippling water, being well pourtrayed; we think you have already hit upon the proper period of exposure from this result. As to your problem, it is rather a difficult one. Do you wish to know what aperture of your diaphragm at a single drop would be equal to three successive drops of a diaphragm with three-quarters of an inch aperture? The alteration of aperture would at once bring a difference of weight into the question, which would upset any theoretical calculation made upon this basis. But if you always adopt the square or oblong aperture in the drop shutter, there would be little difficulty in making a calculation, although, from the fact that you have no means of judging the actual intensity of the light at the time being, the only trustworthy criterion would be to take one or two trial plates. By modifying the developer, as you know, you have a good range open to you.

F. P. F.—Your difficulty in colouring no doubt arises from the fact of the albumenized paper refusing to take the colours. By employing a sizing solution first of all, like that sold by Newman, of Soho Square, you will find matters much facilitated. The same firm sells a shilling handbook which will doubtless be of use to you. Our Publishers will write you.

Ignoramus.—Captain Abney's formula will make from five to six ounces when finished. No extra water should on any account be added. The amount will cover about a dozen and a half 7 by 5½ plates.

W. D.—See above. For other questions we will ask Mr. England, if the above information is not sufficient.

A Subscriber.—You cannot always rely upon the distilled water bought at the chemist's, but being hot is no sign of its inferiority, since it is produced by condensing steam. Spirit is detrimental to the dipping bath. As your plan of doctoring turned out successful, it may well be commended; but, of course, we should have employed a spirit lamp. To remove your pinholes, add a few ounces of distilled water to your bath, filter, and then add silver to make up the solution to its proper strength again.

A. Smith.—Add a few drops of ammonia, which will probably remedy the evil you complain of. We should certainly not recommend all Coignet gelatine; in fact, in warm weather, if used at all, it should be reduced to a minimum.

Alpha.—Yes; it is a sign of traces of hydrochloric acid being present.

W. L.—Certainly not; neutralize before you use it.

Gordon.—Yes; you may put in the chrome alum first.

Pyro.—On the first of April of this year. We certainly never heard of anyone employing glycerine in the developer in this way before.

Amateur's First Shots.—Although an amateur who fires first shots, you evidently know something of lenses. You appear rather difficult to please, for the lenses you speak of have all of them a good reputation. We cannot in this column recommend one maker before another, and any of the five you mention would no doubt readily meet your wishes as far as they can be met. We should scarcely have thought that the first lens you mention is too slow for gelatine plates. Try the opticians in the order you mention, or send for one of Morley's catalogues.

Amateur.—The bichloride may be used a second time, in many cases; it is not, however, a very expensive salt. The Glasgow Photographic Association, which meets at 172, Buchanan Street, would no doubt be glad to enrol you. Write to the Secretary, Mr. A. Robertson, for particulars.

Robt. Brown.—Silver plate is engraved a good deal by hand, but we cannot give you any precise informatio n.

X.—Next week.

T. H. Thompson.—Treat as you would ordinary gelatine, only of course in the dark. Placed upon an open fabric and kept not too warm and with plenty of air, it will soon dry; then cut it up into fragments and pack properly.

South Devon.—Our advice is "let well alone," if you are so far satisfied. We should certainly hesitate to say *all* emulsions, and unless you have some knowledge of its preparation, or of the preservative to be employed, you run a risk.

Ignoramus.—You must introduce the plate into the developer in the dark-room; so where would be the use of your non-actinic developer?

A sub ab initio.—1. You might try citric acid, but, unfortunately, you have already deposited iron in the fabric. Washing with a sponge at the time would have been most effectual. 2. The solution is super-saturated; add a little more of your solvent.

A. H. H.—See Photographic News for 16th April, which gives proportions for the Artotype process. If your ink adhere to the gelatine, the latter has not absorbed enough water. Ordinary lithographic ink may be employed, but it is best diluted. You can only get the right tint and consistence by experience.

A Beginner.—It is best to have your hyposulphite of soda solution strong.

The Photographic News, June 11, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

SOLAR PHYSICS—PHOTOGRAPHY AND WEDDINGS—AN ASSOCIATION FOR PROFESSIONAL PHOTOGRAPHERS.

Solar Physics.—There appears just now to be a considerable amount of heart-burning in the breasts of those scientific gentlemen who have made the sun the subject of their daily thoughts. It was started by an article in the *Standard* about a month ago, wherein the advisability of continuing the Government grant in aid of researches in solar physics was strongly urged. It was laid down that the study of the sun's spots and their variations was of extreme importance, since the meteorological conditions of the earth were possibly subject to these variations; and very much in the way that Tenterden Steeple was the cause of the Goodwin Sands, so Indian droughts and famines, storms, cyclones, commercial panics, and a good deal more besides, were due to the erratic behaviour of the sun's spots. This appeal for pecuniary aid seems to have greatly excited those who are not disposed to give the sun credit for these terrestrial disasters, and one Fellow of the Royal Astronomical Society, writing in a quasi-scientific journal, did not hesitate to stigmatize it as a "begging letter article," and to insist that "not one Englishman in a million" had, prior to the appearance of the exordium, the faintest idea of the existence of a "Departmental Committee on Solar Physics," upon a report from which body, it should be mentioned, the article in question was based. And the Fellow was not content with this, for he went on to state that all the articles upholding the Departmental Committee and the culpability of the sun were written by members of a ring who were moving heaven and earth to pick the national pocket under the flimsy pretence of making "original researches." This is certainly a very serious charge, and, whether true or untrue, places one on the horns of a dilemma; for if the Fellow be right, then the credit of the "Committee on Solar Physics" for accurate observation and sound deduction is completely undermined; while if he be wrong, then the sun, whose sins of omission are already numberless, is really much worse than we have generally believed him to be. Photographers, who may be said to have a strong personal interest in the reputation of the centre of the solar system, will be pleased to hear that the balance of opinion, so far as it has yet gone, is not in favour of the views of the "Departmental Committee," for Lord Lindsay, writing to the *Daily Telegraph* a fortnight later, pointed out that observations of sunspots had for years been made at observatories both public and private, too numerous to mention, while records of observations of sunspots, from the date of the invention of the telescope down to the present time, had been collected by Dr. Wolf, of Zurich, who deduced from them tables showing that sunspots did not vary in the regular manner that was commonly supposed. "On one occasion," observed Lord Lindsay, "more than sixteen years elapsed between two consecutive periods of maximum sunspot development, and at another time two consecutive maximum periods followed one another within seven and a-half years." And his lordship wound up by expressing an opinion that we are far from being able to predict the dates when sunspots will be most developed, while, if men were able to make such predictions, there is no evidence to show that there is any more connection between sunspots and famines than there is between comets and wars or the planets and the death of kings. But this is not all, for a "Fellow," returning to the charge the following week, pointed out that, while Professor Stokes, in writing to the Indian authorities, stated that for the last year or two the sun had been in a condition of unusual quiescence, so that in the whole series of photographs sent home there were only two or three small spots, the Committee, in their report, considered that Mr. Lockyer, by his laboratory work and comparison of the results with solar phenomena, had brought together a great body of evidence tending *prima facie* to conclusions of the utmost importance. Now this contradiction is, to say the least of it, singular; and, if it be true, as a "Fellow" puts it, that Mr. Lockyer, by an examination of a mass of "absolutely blank and structureless negatives," has brought together this "great body of evidence," why the feat must be deemed one of the curiosities of science. But where doctors differ it is rash to decide, and it may be that Mr. Lockyer has a good deal to say on his side. Now that photographic observation is so essential a part of astronomical study, the matter should not be a difficult one to settle, as the evidence must surely rest on the records of the camera. The quarrel is certainly a very pretty one, and the question of whether the sun can change his spots, and, if so, how often, threatens to become a standing dish of scientific controversy, and by no means so easy to answer as the biblical interrogatory in reference to the leopard.

Photography and Weddings.—Photography would appear to be growing more and more indispensable to the three important stages of life—births, marriages, and deaths—if, indeed, by any process of casuistry, death can be pronounced a part of ones' life. Babies have long held the first position so far as number is concerned, death may be said to have taken second place, and marriage the third. The connection of the latter epoch with photography has generally been signalised by pictures of wedding groups more or less ugly, and which pictures both bride and bridegroom at some after period of their existence must utterly loathe. After the severe trial of the marriage ceremony the nerves of neither the lady nor the gentleman can be said to be under that perfect control which is conducive to placid and natural expression of countenance, and more or less vacuity is generally the result. Now our Parisian neighbours have began to order these things better, and instead of the hurried grouping on a lawn of hungry people if before the breakfast, or of exhilarated guests if afterwards, they distribute to each of the company, as a souvenir, medallion portraits of the bride and bridegroom. How much better is a fashion of this kind, which need not be expensive, and thus become popular, than the old form! The portraits of bride and bridegroom taken in the studio beforehand in the ordinary way, and approved of, must be in nearly every instance far superior to the results where, in most cases, she will be represented as looking intensely miserable. Besides, the medallion souvenir is one that can be put in an album, and so easily retained.

An Association for Professional Photographers.—It is easy to say that a fashion of some kind should be introduced, but here comes in a practical difficulty, which every portrait photographer must have felt over and over again. In other businesses dependent on fashion there are ways and means of starting a demand for some novelty. This does not appear to be the case with photography. There is no combination of strength in the profession. One man may strike out a line for himself, but here it remains, known only to his particular customers, and without influence on the general public. This weakness has been greatly felt since the dwindling down of the carte mania. People do not wish to have their portraits taken, and photographers complain of a falling-off in their business—two things, we imagine, greatly due not merely to a want of novelty, but also to the absence of a unanimous resolve among photographers to push any novelty on its introduction, and so make it for the time being the "rage." Why should there not be some kind of association of professional photographers, which would enable them to meet and discuss matters relating purely to the commercial aspects of the profession?

In the ordinary societies these topics are of course tabooed, and wisely so, but there is no reason why there should not be opportunities elsewhere. There is certainly need of some impetus to raise the present drooping state of affairs, of which most portrait photographers are complaining.

At Home.

MR. H. P. ROBINSON AT THE GREAT HALL STUDIO, TUNBRIDGE WELLS.

There are photographers and photographers. Perhaps in no other profession except those of literature and art do we find so vast a gulf as between the highest and lowest in photography. Among painters there is the President of the Royal Academy, and the humble producer of signs. Among authors there is the historian who is making his name immortal, or the poet Laureate, who is the glory of his generation, and the penny-a-liner who hunts up conflagrations, and writes sensational reports upon big gooseberries. In photography we have those who by earnest study and thorough education have elevated their art to the level of the great professions, and the man, to be found in every town, who manufactures cartes at a few shillings per dozen. We do not wish to speak deprecatingly of the low-priced photographer; he is just as useful in his way as are the humbler workers in literature in theirs; he performs an important duty to the community by supplying cheap portraits, which, if they do not stand high as art productions, present at least recognisable likenesses. It is his object to produce portraits at a cheap rate, and he docs well what he is called upon to do. But it is not of him or his class, useful as it may be, that we have to speak, but of a gentleman who is truly one of the princes of the camera, who has helped to make photography into the great art, as apart from science, it has now become.

The author of "Pictorial Effect in Photography" is so well known to our readers in his pictures, which have been exhibited year after year, and gained medal after medal, that we have no need here to dwell upon the charming compositions that have issued from his studio. The poetry of "Fading Away" has not only stirred the breast of many onlookers, but has inspired the novelist, for in "Old Charlton" we may read of an incident suggested by this very picture. "When the Day's Work is Done" is another touch of pathos conveyed by the camera, and the same may be said of the gay summer scenes, the deep shadowed pools, the open heather, the breezy yachting pictures, that Mr. Robinson has transferred to paper. These works need no praise on our part, for the simple reason that their high excellence has been acknowledged by competent judges time after time.

There is, indeed, no other photographer living who has been honoured with so many medals for pictures and portraiture as Mr. H. P. Robinson, the awards in gold, silver, and bronze, which it has been his good fortune to receive, amounting at the present moment to within two or three of half a hundred. The gold medal of the last Paris Exhibition—only one was given for portraiture—came to Tunbridge Wells, to the Great Hall Studio, and so great a show does the shining collection of awards make in Mr. Robinson's atelier, that one might almost mistake his vocation for that of a collector of medallions rather than of an artist.

Mr. Robinson's studio is one of the very few buildings that has been built for the particular purpose they fulfil. Moreover, from the fact that it was planned and constructed after years of experience gained at Leamington and in London, we may take it that its design is well nigh perfect. But if further proof of this were wanting it is afforded by the charming studies of children that meet one at every turn, and which at one and the same time proclaim the artist and the man of tact. For in the case of these infantile portraits the possession of art knowledge does not, as every photographer knows, alone suffice. The taste and rare skill with which the tiny sitters are posed and draped is easily accounted for, since beyond being a fervid disciple of the camera, Mr. Robinson has been a painter all his life, the Royal Academy having admitted his work before he had attained his twenty-first birthday. But long study of photographic art and of the requirements of camera and sensitive plates has also been necessary to give our host the command he exercises over his models, and the reason why so very few photographers succeed as Mr. Robinson succeeds, is because they either lack his knowledge, or do not take such infinite pains over the work. No doubt his studio permits him to secure more easily the effects he desires, but this, too, is the result of his labours as a photographer and artist combined.

Mr. Robinson's studio is remarkable from the fact that it does not contain one of Seavey's backgrounds. The backgrounds here are all prepared by our host by a modified Faulkner process. This clever method of Mr. Faulkner, which has now been published, was to rub wet chalks of the proper tint upon wet canvas, and afterwards soften down the effects with an ordinary clothes brush. This method of using chalks is as simple as it is effective. A skilled eye and practised hand are indispensable for applying them and wielding the brush; but any photographer, who is something of an artist, will find the plan far more simple than the distemper painting. "Just took me an hour," said Mr. Robinson, pointing to a bit of sea and rock, against which he had been posing some bare-legged youngsters; the background had evidently taken their fancy, or something else, for their portraits were as lively and merry as if the beach were before them.

The studio measures thirty-six feet long by some fifteen feet wide. The lighting is north, and as the wainscoting at the side runs up to a height of five feet, it is from a steep sloping glass roof that the illumination comes. There are a few curtains, but of the most simple character. Mr. Robinson never sees the sun the whole day long. Here is the camera pointed ready for a panel or promenade portrait, for Mr. Robinson has for some time past introduced this style of picture. "What lens are you using?" we ask. "Dallmeyer's 2A portrait," is the reply, and then, in his bluff characteristic manner, our host adds, "not that I think it's the best; but I've got it."

Mr. Robinson thinks there is a great future for the panel portrait. Already he has albums for them. "I always insist upon angular openings," says Mr. Robinson, in reference to these albums, "and I have great difficulty in getting them." The panel portrait permits the photographer to exercise taste and skill in arranging drapery, and ladies' dresses lend themselves particularly well to the style.

A series of theatrical scenes which Mr. Robinson has just executed were exceedingly good. You saw the whole breadth of the stage, which was bordered in excellent taste with ferns and flowers, out of which grew the footlights. The pictures presented certain episodes in play and farce, and the action and expression of the players were capital. Here is a party of six at one of those scrambling untidy dinners, inherent to the "screaming farce"; here a drawing-room, with two ladies tête-a-tête; here a verandah looking on to the briny ocean, with a lady evidently in hysterics, and a nervous gentleman at his wits' end to soothe her. What Mr. Robinson does, he certainly does well. The series, which numbers upwards of a score, were secured upon gelatine plates, but Mr. Robinson gives all the credit of their success to an able stage manager. Be this as it may, they are certainly the funniest, as they are the most perfect, theatrical representations we have seen reproduced by photography.

We must not forget to say a word upon the subject of carbons on opal, apparently the most delicate form of photographic portraiture produced by the method which Mr. J. R. Sawyer has given with considerable detail in these columns. Here is a charming little lady with quaint satchel and coal-scuttle bonnet, the colouring soft and harmonious to a degree. Nor must we omit to mention the beautiful photographic enamels for which the Great Hall Studio has been famous for some years past. We see that the prices asked for enamels vary from fifteen shillings to three guineas.

The whole of Mr. Robinson's establishment, so far as the public is concerned, is on the ground floor. The reception room opens into a small gallery, fresh and green with ferns, out of which lead the dressing rooms, while further on is the studio. Children's portraits, as we have remarked, is what Mr. Robinson delights in, and everywhere these laugh at

you from tho walls, or coyly peep from the corners. As we gave a last look round at these happy faces, we could not help thinking what a world of good the misanthrope would derive from a contemplation of them all.

A good test of the quality of a man's productions (on the principle that a thing is worth what it will fetch) is the price he gets for them. Mr. Robinson continues to maintain respectable and "professional" charges, notwithstanding what many people would consider severe competition, for there is a host of photographers in Tunbridge Wells, and of all degrees. But cheap photography does not really injure the heads of the profession; the public have become appreciative, and know that good work can only be got for a good equivalent in love or money. At the same time there is this difference between a true artist, like Mr. Robinson, and the ordinary commercial photographer—the latter must make a profit on everything, the former spares no trouble or expense to get the best results. He says it pays in the end, and we believe him.

The next "At Home" will be "M. Nadar in the Rue d'Angou, St. Honore."

THE OXY-HYDROGEN LIME-LIGHT.

BY REV. T. FREDERICK HARDWICH.*

The oxygen tap should be turned on "full" from the beginning, so that you may have a correct measure of the flow of gas, and know exactly how long it will last. The hydrogen tap must be only partially turned on, and hence an additional pressure of some ten or twenty pounds will be needed on that bag. This is contrary to the rules usually given to avoid risk of explosion; but I have already explained that such fears appear to me to be needless, and therefore I load the bags either equally or unequally, as I find most convenient. Provided the two gases reach the orifice of the jet in the right proportions, it matters not whether the supply be regulated by the taps or by the amount of pressure on the bags.

A condenser, ground from the best optical glass, like that supplied by Mr. Dallmeyer, is a valuable instrument, and it would be mortifying to see it broken through carelessness. The danger lies not in the heat radiated from the incandescent lime, which is comparatively little, but in the tendency of the flame to become forked and to turn back towards the condenser. For this reason I cannot use lime cylinders that are too soft; they are so easily perforated by the stream of gases, that the flame is constantly splitting up and being deflected from the edges of the hollow cup so formed. The hard white magnesian lime answers much better in this respect, but, unfortunately, does not give an equal amount of light with the same consumption of gas. I have lately obtained a quality labelled "medium hardness" with which I am satisfied, as it resists the drilling action of the flame for a longer time, and the light is good.

This subject being important to all who use condensers of short focus, I may venture to recapitulate the directions before given for preserving both lime and condenser from cracking. First turn on the coal gas only, and allow it to burn against the face of the lime for a minute or two; then introduce enough oxygen to increase the heat and make the flame burn *red* for an equal time; after this the two taps may be worked up to each other, until the oxygen is on full, and the flame is burning small, with a fringe of red at the edges. By observing it through a circle of blue glass you see perfectly when the maximum of light is obtained, without looking at the disc. The lime will require occasional turning, about once in eight or ten minutes, but the flame itself will need very little further attention during the lecture. Keep it tipped with red, but not large in size, which would show too great an excess of hydrogen.

For the sake of my brother clergy who labour in country villages where coal gas cannot be obtained, I here give a simple and economical mode of preparing hydrogen gas in quantity. Take a two-gallon stone jar and fit it with a sound bung, through which passes a piece of metal gas-tubing three or four inches long. Varnish the cork with sealing-wax or Brunswick black, to stop out the air holes, and push it into the jar on a piece of chamois leather dipped in oil, securing it with string if necessary. Now connect it by india-rubber tubing with an ordinary gas purifier (which you can make out of a pickle bottle), and your apparatus is complete. To charge it, you have only to put into the jar two pounds of iron turnings and a pint and a half of oil of vitriol diluted with ten pints of water. The action will be rapid; and when the gas has been coming off for a minute, you may conclude that the greater part of the atmospheric air in the bottle is expelled, and may allow it to enter the bag; the operation will be complete in an hour without further trouble. The iron must not be too pure or it will not dissolve: *cast* iron answers best, and the grey kind better than the white. Filings of cast iron are too small, and would probably make the acid boil over with lively effervescence. I mention iron turnings as being cheaper, but granulated zinc, or zinc nails, such as the slaters use, will answer equally well. Avoid bringing a lighted match too near to the corks at the beginning, as there may be some *air* still remaining in the bottle; but this will be afterwards so diluted with excess of hydrogen in the bag that it will be rendered quite harmless.

I have tested the comparative merits of hydrogen and coal gas by using them in the same lecture. No great difference was observable, except that the coal gas lasted longer; as I expected would be the case from its known composition. On consulting the best authorities I find that they are not agreed on this question; for whereas one eminent chemist says that a mixture of hydrogen and oxygen burns with the hottest flame known; another, almost equally eminent, asserts that olefiant gas, or coal gas mixed with oxygen in suitable proportions, gives a flame at least as hot as the other. If such be the case, the coal-gas, when procurable, will be preferred, as hydrogen, from its high diffusive power, is very difficult to store for any length of time in waterproof bags.

I cannot conclude this paper better than by quoting a remark made to me by a friend who is very successful with the lantern, "What we now want is a larger and more varied selection of slides; and we must look to photography to supply this desideratum."

* Concluded from page 269.

GELATINE OR COLLODION: WHICH PAYS BEST?

BY JOHN S. HAZARD.*

My paper to-night is written simply to provoke discussion as to whether using gelatine dry plates pays better than taking negatives by the collodion process, and also to attempt to dispel, if possible, the grave doubts that still remain in the minds of many photographers as to whether they may safely say "good-bye" to collodion and swear by gelatine. Before adopting the new system I had a few years' experience with the old process; and now, not having used one drop of collodion since October, 1878 (save for coating a valuable negative previous to varnishing), I have had a little experience with gelatine, and trust I am in a position to speak as to both sides of the question, and to know which pays best.

I am compelled to say I must give gelatine the preference. I have not brought my books for your inspection to show why I say so, nor do I intend to go into particulars in reference to the working of my own business; for, doubtless, my arguments in that way would not meet every case, especially when brought to bear against another class of business to mine. I wish merely to state some general facts that, I trust, will meet with your consideration.

In the first place, dry plates pay best, because by their use less assistance is needed and time required to produce the finished negative; hence time and wages are saved. There is no preparation of the plate, no development until the close of the day, or, as I prefer it, early the following morning. I know a photographer who, on one Saturday last month, had nearly a hundred sitters after one o'clock p.m. All the help he had was a lad to number the plates and hand them out of the changing-room. I leave you to say whether, under the same circumstances, that could have been done by the wet process. All these plates (they were 136 quarter-plates) were developed in about an hour—not, of course, one at a time, but in batches of 10. From experience I find that if care be used in watching the exposures during the day—that is, keeping negatives which are doubtful from those you are certain are exposed correctly—that is a sure and quick way of getting through the development. "Time saved is money gained."

I trust you will agree with me that in photographing groups gelatine has the best of it. Fewer negatives need be taken

* Read before the South London Photographic Society.

to secure good results; and, especially when the group is a few miles distant, how comfortably you can go to work! How cab-hire and hired help is dispensed with! No dark tent, with acidified nose, and eyes and lungs filled with ether, but a changing-box and a few plates! It makes no matter how long the group is in getting quite "ready" for you to start—a fearful time this used to be, with the temperature up to 90° in the shade and the wet plate drying up—some one not having arrived who must be in the picture. What grand oyster-shelling and pin-holing went on during those days of wet plates! But now you can with an easy mind wait as long as your patrons wish, and the result is in every way more satisfactory.

I must not pass on without stating this fact:—For some years past I have photographed groups at several colleges in London. Last year many of the negatives were not taken until November; but, notwithstanding this, in every case the groups were so satisfactory that the orders were double those of any previous year—another reason why I give gelatine the preference.

The rapid exposure in the studio and the disuse of the head-rest make your studio popular; hence there are more customers and more cash. Scores of my sitters have come from long distances (many of them never having been photographed before), because previous customers have gone home and reported favourably. I assure you I have often taken half-a-dozen negatives of a nervous sitter before he or she had any knowledge of having my commenced the "dreadful operation." In this way better expressions are caught, and you receive larger orders than otherwise.

As regards the time saved in retouching there is great gain; for, from what we can learn, dry plates require but one-tenth of the work needed by wet plates—in fact, as a rule, they need none.

In conclusion: allow me to add that in using gelatine plates you are always ready for your sitters, who need never wait many minutes to have several negatives taken. With a changing-box by your side twenty-four cabinet portraits of one person may be taken in a quarter of an hour. This especially pleases public men, who grudge the time spent in being photographed. I trust there are photographers present whose experience has been similar to my own, and whose testimony to-night will tend to banish doubts from even the most unbelieving photographer's mind.

DEVELOPMENT OF OVER- AND UNDER-EXPOSED BROMIDE OF SILVER PLATES BY FERROUS OXALATE DEVELOPER.

BY DR. J. M. EDER.

It has been asserted that good negatives cannot be produced from over- or under-exposed gelatine plates by means of the ferrous oxalate developer. I am anxious to show that this view is not a correct one when the developer is prepared by my method of mixing potassium oxalate with ferrous oxalate.

Mixing the two salts on the plan adopted by me is preferable to that of boiling the two together, although Mr. Carey Lea, the originator of ferrous oxalate as a developer, recommended the latter. In fact, before I published my instructions for the mixing process, no good results were obtained by that method. Carey Lea himself declared that the mixed developer would not work quite so satisfactorily as the boiled one, the consequence of which was rather to withdraw the process from, than to introduce it into, photography. Even now he does not employ it. When Mr. Sherman recommended the production of an oxalate developer by mixing with ferrous sulphate, he misjudged the principle to such an extent that everyone who tried his formula was forced to believe the developer produced by mixing to be useless, for he added so much acetic acid as to separate and render inactive a large proportion of the ferrous oxalate.

When I first turned my attention to the investigation of the ferrous oxalate developer, more especially of that prepared by mixing with ferrous sulphate, I had no starting point. I was first compelled to find out how to prepare a serviceable ferrous oxalate developer by mixing, and was obliged to prove that, when properly made, it works admirably. Only after I had thus endued the method with vitality was it fit to be employed in photography. It is a fact that a few weeks after the publication of my researches the process was in general use. Why was it not employed four years ago, if then really practicable? Why also am I denied the right of calling this method of mixing the developer my method? Before me it was not workable, and therefore was not employed; after my experiments it was found to be excellent, and capable of being practically employed. I am quite willing to admit that others have published methods of mixing the oxalate developer which gave satisfactory results, but no one can deny that I was the first to discover and thoroughly investigate a really feasible method.

To return, however, to our subject. I must first state that the great advantages of the ferrous oxalate developer are only recognised in working with highly sensitive plates—that is, with those containing the so-called green bromide of silver. What follows, however, is also true for other silver bromide plates.

If an over-exposed gelatine plate be dipped into a ripe solution of ferrous oxalate, the image will appear in a few seconds. Directly it is observed that the plate has been too long exposed, a few drops of a (1 : 10) solution of bromide of potassium, or of water only, must be added. When the plate has not been too much over-exposed, it can readily be developed by this means; but should the exposure have been a great deal too long, the plate will fog so quickly that there will be no time to introduce the potassium bromide. I therefore recommend the following method of developing a plate concerning which it is not known whether the exposure has been too long or too short (this is often the case with pictures taken in the open air), or when the exposure has actually been excessive.

Take 3 volumes of a solution of potassium oxalate (saturated cold, and, therefore, approximately of a strength 1 : 3) and one volume of a solution of ferrous sulphate (1 : 3);* the two must not, however, be at once mixed together, but at first only a few cub. centim. of the ferrous sulphate must be dropped into the other solution. With this weak developer the development is commenced (at first without any potassium bromide), and on strongly over-exposed plates the image will at once appear, full of detail, free from fog, and very vigorous. If the image be rich in detail in the shadows, but not sufficiently vigorous, a few drops of potassium bromide solution (1 : 10) should be added, as well as a little more of the ferrous sulphate. Plates developed with a weak developer, and one free from potassium bromide, are clear, but thinner, softer, and more equal than those developed with a stronger solution containing bromide; the latter are also clear, but richer in contrast, denser, and harder—sometimes too hard.

Should the negative not develop sufficiently with this weak solution, more of the ferrous sulphate must be added, and gradually, when necessary, the whole quantity of the latter salt originally measured off. If the plate has not been exposed for too short a time, it will develop in from three to five minutes. Vigour, clearness, and contrast can be produced by potassium bromide. Many plates of the less sensitive description require no potassium bromide, as it may cause them to become too hard; with sensitive plates more or less of that salt must be used to make them sufficiently clear and vigorous.

With these successive manipulations, negatives can be readily developed whose exposure has been even as much as twenty times the right length; it is as easy by this means to produce good negatives after much too long an exposure, as after one of the right length. The mixed ferrous oxalate developer can be adapted to correct over-exposed plates with greater certainty than the pyrogallic developer. In this method of development lies the future of the ferrous oxalate developer; and the above modification of it makes it easy of practice for the least experienced.

* This proportion is the one which I may call the normal one in my method; I may refer my readers to my former treatises on this point. Particularly, the potassium oxalate must not have an alkaline reaction (this would cause fogging), nor must it contain too much free acid, or the developer will grow turbid a few minutes after mixing.

Much greater difficulty will be found in adapting the ferrous oxalate to the development of an under-exposed negative; but then the same objection will be met with also in using the pyro-developer for that purpose. Care must therefore be taken to guard against under-exposure.

I have, however, discovered a method of rescuing even a much under-exposed plate by the use of a specially strong ferrous oxalate developer. I first prepare, and keep in reserve, a very strong solution of the ferrous oxalate. This I effect by heating, in a porcelain basin, 50 to 60 grammes of neutral potassium oxalate in 100 cub. cents. of water, and when it is dissolved adding 17 to 20 grammes of crystallized ferrous sulphate; the latter, if well stirred, and with the continued application of heat, will dissolve very quickly—more rapidly than precipitated ferrous oxalate. When the whole is completely dissolved, I pour the dark red solution into a well-stoppered flask, and let it stand for twenty-four hours. In cooling, a considerable quantity of potassium sulphate will crystallise out, but no active oxalate; the effective potassium ferrous oxalate remains in solution even when cold, although, as is well known, potassium oxalate alone is only soluble to the extent of thirty per cent. in cold water.* A developer prepared in this way contains from twelve to thirteen per cent. of effective ferrous oxalate—that is, about double as much as my normal mixed oxalate developer, or as any other oxalate developer in use produced by boiling; it has consequently a much darker colour, and acts also much more energetically. This reserve of strong developing solution is then filtered, and poured into small well-corked bottles, which must be filled up to the top; in this state it will keep for months.

When a plate will not sufficiently develop after from five to ten minutes' use of my ordinary developer, the latter should be poured off, and the developing pan filled with what I call my "strong reserve developer;" the plate should then be dipped into it without any previous rinsing. Should any fog appear, add a little potassium bromide. From the appearance of the plate after the first attempt to develop it in the ordinary developer an idea may be obtained whether it is likely to fog, and, guided by that appearance, the operator can judge if it be necessary to add the potassium bromide, and to what extent.† It is, I think, unnecessary to enter into any further details; those who may wish to know more on the subject will find full particulars in my former publications.

The inconvenience of having to prepare "a strong reserve developer" I consider not to be very great, inasmuch as a stock of the same can be kept for a long time without its altering. It is, at any rate, an inconvenience which must be put up with if the operator has not been sufficiently careful to judge the time of exposure correctly; for my own part I am glad to have been able to discover a means of developing under-exposed plates with the oxalate developer. Its special advantage, however, lies in the facility with which over-exposed plates may be developed.

Only one objection of importance has ever been raised against the use of the ferrous-oxalate developer, namely, that it was powerless to correct over- or under-exposure; this objection is, as I have above shown, no longer justified.

GELATINE PLATES FOR LANDSCAPE WORK.

BY E. DUNMORE.‡

I have this evening brought a few prints from gelatine plates as being more interesting than showing the negatives, which at best, are but means to an end, and often very deceptive. You must bear in mind I do not exhibit these as works of art but merely as the result of a day or two's outing. Thirteen were exposed during one day, twelve of which are amongst those I have brought to show you to-night, and the exposures varied from half a second to ten seconds for outdoor, and five to ten minutes for interiors. I do not, I must say, find there is any less sparkle than with wet plates. The greatest difficulty I find is too much intensity; but, at the same time, with more exposure I have no doubt the development can be made to remedy that. These being the results of my first attempts at general work with the new process, there are sure to be faults of manipulation easily remedied in the future.

The plates used were of four different kinds, which, unfortunately, got mixed together without hope of separation; so I treated them all to the same proportionate exposure, although they were represented as possessing varied degrees of sensitiveness. The results, however, did not altogether bear it out. I may say I judged the exposure (from a trial previously made) would be—with the lens and stop I was using—three seconds for the best light I should be able to get during that particular day, and with this standard I regulated the exposures.

I am inclined to think that the best pictures are got not by trying how rapidly they can be done, but by trying how long they can be exposed without spoiling. The very brief exposures in my hands invariably resulted in want of atmosphere, which, with both gelatine and wet collodion plates, is a sure sign of under-exposure. So much depends on development that over-exposure can, within reasonable limits, be remedied; but under-exposure cannot.

M. JANSSEN ON THE USEFULNESS OF PHOTOGRAPHY IN SCIENCE.

In a communication to the *Académie*, M. Janssen, the able director of the new observatory at Meudon, refers at some length to the assistance which photography is able to render to astronomical science, even in obtaining exact micrometrical measurements. To the difficulty of determining the actual instant of contact he attributes the comparative neglect by astronomers of observations of partial solar eclipses, in favour of those which are total annular; and this very difficulty he claims to have removed by means of the addition of the photo-heliograph of his well-known apparatus, the *Revolver*. By the aid of this instrument twelve or more solar photographs may be taken from six to ten centimetres in diameter, at intervals of a second. Contact can never be observed with precision by the eye, in consequence of the slight deformation of the solar disc at the moment when the moon enters on its surface; but with the *Revolver* a series of photographs can be taken at this critical moment—photographs which the astronomer can examine at leisure, and which, if the lens employed gives sufficiently correct images, can be used for deducing accurate measurements. There are other doubtful points which, as M. Janssen thinks, the photographic examination of a partial solar eclipse will be able to clear up; the first of these is the existence of an atmosphere on our satellite. The photographic image, he says, when enlarged in the manner he has previously pointed out, renders with complete effect the granulations of the solar surface. Now if there be a lunar atmosphere, it must, when the moon is projected on the disc of the sun, deform by refraction their granulations, and the density and depth of the gaseous envelope can be calculated to great nicety from the amount of deformation as observed on the enlarged photographs, where the granulations are distinctly visible.

Another unknown quantity which he thinks may be evaluated by the same method—the height of the lunar mountains, situated on the edge of the limb, precisely where the measurements actually employed are most difficult and uncertain. A photograph of the sun during a partial eclipse will give us a perfect outline of the image of the moon projected on the larger heavenly body, and the micrometric measurements of the projections of that outline can be obtained in the simplest manner by comparing their size with that of the solar disc. On account of the librations of the moon, however, it will always be necessary to know previously what is the actual portion of the moon's surface which is thus projected on the disc of the sun.

* It is my intention at a future time to draw up an accurate table showing how the solvent power of a hot potassium oxalate solution for ferrous oxalate increased with the contained per centage of the salt. My investigations on this point are nearly finished, and, when they are completed, I hope to publish them.

† It is possible that the strong reserve developer will be found to act as a rapid developer for gelatine plates; but for the present I only recommend it for exceptional use in the cases above mentioned.

‡ Read before the South London Photographic Society.

The Photographic News.

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CONTENTS.

MANIPULATION OF GELATINE EMULSION

Whether it will pay amateur or professional photographers hereafter to prepare their own gelatine plates is a question that we need not now determine; but certain it is that the majority will try their hands at producing the sensitive pellicle. The matter will ultimately resolve itself into one of money; if photographers find that with a moderate expenditure of time and trouble plates can be made at home as good and more cheaply than those to be purchased, home-made plates will naturally be resorted to; on the other hand, those who set a high price on their labour, or have no time to spare, will be glad enough to purchase the emulsion or plates ready for use. Already the cost of plates in the market has been considerably reduced—the price was absurdly high a little while ago—and with so many able makers engaged in the manufacture of gelatino-bromide, we are now getting more steady and equitable prices.

The number of photographers who will continue to prepare their own plates may therefore be limited, but at the present moment, nine out of ten would appear to have prepared the emulsion, or at any rate made experiments in connection with its preparation. We have, in these columns, repeatedly given formulæ for gelatino-bromide plates, and have also said something of the manipulations involved; and it is in respect to the latter more especially that we would to-day have a further say. But first a word about the transparency of the gelatine employed in emulsion making. As a rule, the makers of plates will have nothing to do with gelatine that is slightly turbid. It must be perfectly clear, or they refuse it altogether. It does not matter how tough or sound it is; if there is turbidity in the solution, they will have none of it. On the other hand, gelatine containing traces of hydrochloric acid (used in opening up the bones in gelatine manufacture) or of sulphuric acid (which is employed for bleaching) is not objected to, supposing a solution of it is perfectly clear. Now, we believe, that a slight turbidity is no drawback to an otherwise good sample of gelatine; the film on the plate is so thin that the defect is really inappreciable. We have experimented with gelatine of an extremely turbid character—nay, even with isinglass—and, so far as transparency of the film is concerned, have found no appreciable difference between it and that given by a transparent gelatine. The manufacturers of gelatine, we hear, are at their wits' end to know how to satisfy photographers; the former have no difficulty in supplying a neutral gelatine which is a little turbid, or transparent gelatine with traces of acid, but they find it next to impossible to make a neutral transparent material. Photographers, in taking a choice of the two evils, prefer to employ transparent gelatine.

In adding the silver solution to the dissolved gelatine and bromine salts, care must be taken, as we all know, to do so very gradually. Some prefer to blow the warm silver solution from a chemist's wash-bottle, others to permit it to fall from a filter, with a drawn-out orifice, in a fine stream. The burette will be found, however, a very handy piece of apparatus for this work, a wide tube fixed perpendicularly, having a tiny glass stop-cock at the bottom, to control the falling stream. An instrument of this description, graduated in cubic centimetres, may be purchased for three or four shillings, and will be found useful in the photographic laboratory in many other ways. In this case, the warm silver solution is introduced into the burette, and while stirring the gelatine with one hand, the stop-cock may be turned with the other. The silver solution may be permitted to fall by drops, or in a stream at intervals. Moreover, as the silver falls into the gelatine solution, you are able, by means of the graduated scale upon the burette, to note how much has fallen, and to control the addition with the greatest nicety.

Another point of importance is, of course, the well-stirring of the gelatine during the falling of the silver. We have found a modification of a chocolate stirrer to be a most convenient tool to use. In making from ten to fifteen ounces of emulsion, a stirrer, about the thickness of a lead pencil, but longer, answers the purpose well, and may be twirled in the fingers of one hand. For our purpose we employ wood, the end of the stick fitting into a cross or star, and have never known any injurious effects from its use. It is manipulated by one hand only, and if the silver solution to be added is contained in a burette with stop-cock, this, the most difficult operation of all in connection with the preparation of gelatino-bromide, is considerably simplified. A hot-water can should always have a place in the laboratory during the preparation of emulsion, and the stirrer is put in here when not in use; hot water is very necessary in warming flannels, filters, &c., with which the photographer has from time to time to deal.

As to washing the emulsion, we are not so sure whether one of the very first suggestions made—namely, to employ a dialyser for the purpose—is not the simplest and best. A dialyser is nothing but a description of tambourine, or vessel with a membrane bottom. They are, now-a-days, used in the kitchen as a means of washing salt out of salted liquors or very salt soup, and photographers must not, therefore, suppose that they have a complicated apparatus to deal with. Emulsion placed in the dialyser, and this in water for twenty-four hours, is rid of its salts, if the water has been changed two or three times in the interval. Another simple way of washing is to construct a square framework with four laths, and stretch loosely over it a piece of blanket. The set emulsion is thrown upon the blanket, which is permitted to dip into cold water, and then broken up and manipulated with an ivory knife; if possible, the blanket should dip in running water, but if this is not the case, the water must be changed repeatedly during the half hour or so that the washing continues.

FOGGING AND FRILLING.

The Photographic Society brought its session to an end with a most interesting meeting on Tuesday evening, Captain Abney and Mr. Bolas bringing forward subjects of considerable importance. Captain Abney pointed out that the oxidising action of bichromate of potash might be employed with advantage to cure fogging in gelatine plates. A defective plate of this kind, or a gelatine plate that has been exposed to light, if flooded with a strong solution of bichromate, and afterwards washed, may be converted once more into a transparent sensitive film. Bad plates, he tells us, may thus be changed into good ones. We shall have some one now proposing to make gelatine emulsion in daylight, and leaving it unwashed until transferred to glass, when the application of a bichromate solution, and rinsing in cold water, will complete the manufacture. To prevent frilling—a defect, we are glad to say, that is met with less frequently than of yore—Captain Abney coats his plates with collodion; this film of collodion does not impede the action of the developer in any way.

Notes.

Professor Hermann Vogel proposes to visit London in July, when we are to hear something more of his quickly-drying emulsion.

Mr. Bolas made a practical suggestion at the Photographic Society on Tuesday night. "I have noticed," he said, "that photographers usually employ glass beakers for development, which are exceedingly difficult to find in the dark room; on the other hand, porcelain cups, or utensils of white earthenware, are seen in a moment."

The Paget prize of fifty pounds for the best dry plate process is offered once more for competition, candidates to send in their plates and process to the Photographic Society prior to the first of September; only two competitors entered the recent contest, one bringing forward a collodion and the other a gelatine emulsion, neither of which was sufficiently satisfactory to justify the award.

In his report to the Board of Visitors last Saturday, the Astronomer-Royal commented on the very unfavourable weather of the past year—"a whole month's observations of the sun being lost in July."

A facetious correspondent writes:—The "treatment of the sitter" has always been a subject of difficulty with the photographer. There are little annoyances connected with the head rest that the sitter sometimes feels acutely, such as pinching the back of his head, or inserting a cold pair of tongs under the collar of his coat; and occasionally much tact and good humour have to be displayed to get the grumbling model to sit at all. But there is no need, surely, for the photographer to go to extremes, and proceed in the manner adopted at Stafford, recently, where the sitter, we are told, was actually flogged for "refusing to be photographed." The refractory sitter, it should be explained, was a convicted felon in Stafford prison.

We see that a question was asked in the House of Commons on this very subject, Mr. P. A. Taylor having called attention to the "treatment of the sitter" in this case; the reply of the Home Secretary was to the effect that the man had repeatedly refused to obey the rules, one of these being the photographing of prisoners, and, therefore, the "treatment" in question was perfectly justifiable.

A rapid developing salt for wet plates is sold in Paris at the rate of ten francs per pound. According to Dr. Eder it may be prepared by placing half a gramme of salicylic acid in a mortar, together with a single drop of dilute sulphuric acid, and then gradually adding, while working the pestle, thirty grammes of protosulphate of iron, which should not be too moist. Four hundred grammes of water, twelve of alcohol, and four and a half grammes of acetic acid are employed to make this compound into a developer. The exposure, it is said, may be reduced one-half.

The time is at hand over which the landscape photographer rejoices. The green undergrowth, delicate ferns, and verdant foliage in grotto or mossy dell, that contribute so much to a picture, if they do not form its most prominent feature, will be sought for eagerly. With the aid of a gelatine plate, that exposure of many minutes will be avoided, and the vexatious troubling of a wayward wind set at nought.

But there are leaves that tremble at the least breath, and of these photographers should beware. "Come where the aspens quiver," is advice that most of us, at any rate, would not care to follow. It is almost impossible to secure a sharp picture of some leaves, they are so daintily poised upon the stalk. The fig, the vine, and the Virginia creeper have leaves and stems that lend themselves to the photographer, but of the ivy there are some kinds that have a very unstable leaf. The brake fern is easily shaken, but not so "the waste-paper basket" variety, as it is sometimes irreverently called. The ordinary bramble or blackberry-bush is generally still enough, and makes a charming foreground to a picture, while the thistle, of course, is a staunch friend. Mr. England, Mr. Bedford, or Mr. Payne Jennings could doubtless write us a long essay on the subject if they chose, and save photographers many an hour; "Leaves to leave alone," might be the title.

Mr. Noel Hartley, F.C.S., has been experimenting with some success in spectrum photography. His aim has been to depict the violet end of the spectrum through benzine, anthracine, and napthaline, in connection with an investigation of the "relation of actinic absorption to the chemical structure of carbon compounds." He gave an interesting account of his research at the last meeting of the Chemical Society.

An Austrian photographer, Herr Buchta, has been ascending the White Nile with Marno, the African traveller, and, in company, they have penetrated as far as Ladova. Accounts of African travelling illustrated by photography are still rare, and the experiences of these gentlemen will, therefore, be looked forward to with some interest. The camera robs the adventures of our travellers of a good deal of their former romance, but on the whole, perhaps, this is scarcely matter for regret.

In connection with our description of the Ordnance Survey Office at Southampton, a correspondent points out that the only man who has ever been honoured in this country for improvements in photography was the late Colonel Sir Henry James. That officer received knighthood and a well-paid appointment for services rendered in connection with photo-lithography and photo-zincography. He was director of the Southampton establishment for many years, where his process, as we have shown, is still successfully practised. Strange to say, no practical account of it has ever found its way into print, the book published by Colonel James on the subject being far from perfect as regards working details. The best photo-lithographic process in our experience is that of Mr. Henry Butter, which was recently described in these columns.

Topics of the Day.

PROTECTION AGAINST FORGERIES—PHOTOGRAPHIC AND OTHERWISE.

BY JOHN SPILLER, F.C.S.

The recent conviction of a notorious forger taken with his chemicals, tracing-paper, and implements of trade around him, and the pending trials of other offenders, have awakened fresh attention to the means of combating these ingenious but misguided efforts; and perhaps it would be well now and then to take stock of our defences, in order that the legitimate progress of science may not be allowed to leave in its track certain attendant disadvantages, helping the rogue at the expense of the honest trader.

With this object in view, I propose briefly to enumerate a few of the points which have come under my notice during the last twenty years, having reference to attempted forgery or tampering with bank notes, cheques, and documents, questions upon which I have been frequently consulted by the printers. At one time it was an easy matter to clean off the obliterating stamps from an old postage head, and make it do duty a second time. This is no longer possible, since the principle of litho inks has been adopted, for now benzole will remove the Queen's head equally with the greasy ink stamped upon it.

To combat the removal of writing ink from cheques and documents, Barclay proposed, many years ago, the use of a special kind of paper containing the ferrocyanide of manganese incorporated with the paper pulp, so that any unauthorised tampering with the original manuscript might be immediately revealed by the formation of Prussian blue, the iron being derived from the writing ink when attacked by acid. This project affords protection only up to the point of finding a solvent for the Prussian blue, which is not a very difficult matter.

In the year 1861 I was consulted as to the mode of production of a counterfeit bank-note, which, allowed on all hands to have been a forgery, was supposed to be a spurious print from an engraved plate like the original. The rendering was in parts rather weak and defective, as though the note had been a faint and imperfect impression from the real plate. Shown to an eminent firm of engravers supposed to be well versed in such matters, they reported that "imitation had not been effected by photography." I was set to work to confirm or controvert this decision, and had to try and find out whether an engraver or a photographer was playing the rogue. My experiments led me to fix the responsibility on the latter, for I found that the whole design of the note was bleached by cyanide of potassium, and on burning some of the paper discovered both silver and gold in the ash. I reported the forged note to be "a gold-toned photographic impression," in opposition to the opinion of the aforesaid printers, who had actually produced the genuine notes for a foreign State. The minute details and highly-finished vignette on the face of the note were all accurately copied; the paper was well imitated, and everything agreed with the original, except that a trifling deviation was found in the size of the note, or, rather, in the reproduction of its artistic design, as though by the careless use of the copying camera, or forgetfulness in allowing for the expansion of paper by wetting.

This circumstance, and other facts within my knowledge, prove conclusively that photographic forgeries have at times baffled detection, and it becomes therefore important to study the means of checking such attempts by resorting to the use of "coloured overlays," and preventing, as far as possible, the taking of a photograph from one of the issued notes.

Lately an American discovery has been offering about in London, which professes, by the use of a non-actinic varnish, to render it impossible to copy a note by the camera But here, again, we must look to the guarantee of permanence, for what is to prevent the removal of the said varnish by a solvent, and its replacement by a "colourable imitation," when the work of copying is successfully accomplished? Quinine, according to the testimony of Dr. J. H. Gladstone, would serve in some cases, and tinting the paper is known to increase the difficulties; but I know for certain that one or two bankers are "leaning on a broken reed" in placing too much dependence on the supposed security of their bank notes against photographic counterfeit.

Coloured overlays—by which we understand that certain parts of the note shall be printed over, and to some extent obscured, by the superposition of a coloured design—are undoubtedly very effectual. Transparent, non-actinic colours are best adapted for this purpose; but then they must possess in a high degree the quality of chemical insolubility, or they might easily be removed, and the engraved plate pirated. Vermilion is one of the best, and Canadian green or Indian red are good; but Prussian blue, both from its photo-transparency and easy solubility, is about one of the worst pigments that could be applied upon the face of a note. In my experiments it stood for naught, and I had no difficulty in copying the printed details on a note partially covered with an ornamental overlay in Prussian blue. Ultramarine is too opaque a colour to use for overlays, but lends itself well in other ways to defeat the efforts of forgers; thus if an intricate design be printed on the face of a cheque where the amount and the signature have to be written in, any fraudulent attempt involving the use of acids will immediately make itself apparent by the irrevocable destruction of the fine design on those parts of the note. Mauve is a favourite ground of security depending on the same principle, that of easy solubility, and hence it follows that manuscript documents are more secure if written on ultramarine or blue-wove papers than when executed on the ordinary white or cream-laid, which, under the attack of acids, cannot show any appreciable change of colour.

Of course it follows that a wide range of tints may be got by modifying the fundamental pigment by admixture with almost any one of the well-known artificial colouring matters, all of which are more or less affected, if not destroyed, by contact with acid.

The Topic for next week will be "The Duties of a Lady in the Reception Room," by a Lady.

Correspondence.

PHOTOGRAPHERS' ASSISTANTS.

Sir,—Your clever correspondent, Mr. George Bradforde, has indulged in a fling at employers who know nothing of the business, and, in his own opinion at least, has completely demolished them. As I may be one of the unfortunate wights whom he tries to caricature, if you will allow me I would say a word or two on my side of the question.

A great many years ago I took extensive premises in the principal street of a certain city to carry on my own business, and attached to them was a photographic studio or glass house, printing room, &c. As I did not want to have anything to do with this business, which I "knew nothing about," I let this part of the premises year after year to photographers, sometimes for almost a nominal rent; but, either for want of capital, or want of ability, they never remained long my tenants, and the glass house and the printing room were again on my hands. Whatever I asked as rent, it was always a trouble to get it at the end of the term—if I got it at all. One gentleman, who was going to set the Thames on fire, took the place for six months, and was apparently doing very well, when one morning I took him up two ladies to be photographed. After knocking once or twice at the reception room door I turned the handle, when behold! my tenant was gone, the room was empty, and not

even an old chair was left towards paying my six months' rent.

Disgusted at last with the treatment I had received from photographers, I made up my mind to have nothing more to do with them, and for years I made no attempt to let the place, and allowed my children to make a playroom of the studio. In an unfortunate moment, however, some years ago, I was persuaded to lay out a few hundred pounds in the purchase of plant and negatives of a photographer who had done well in this town, but, owing to losing his sight, was obliged to throw his business into the market. I went to a few more hundreds to have my place done up so that it should not have its equal in this part of the country. The next thing was to get the right sort of people to work up a good paying business. Herein I was fortunate, as my first artist was not only first-class at his profession, and a man of business, but he was in disposition and education a thorough gentleman. My young lady for the reception room also was everything that could be desired—amiable, polite, and entirely trustworthy. So far all was well. In a few years we had, I might almost say, the first business in the place, and amongst first-class people. My troubles commenced, however, when this artist left me to go into business for himself in his native town, where I am glad to say he is doing well. Since then I have had a series of operators or managers, but have never been fortunate enough to find a second like my first. Some, whilst full of conceit, have been slovenly and careless; whilst others, of intemperate habits, have thought nothing of staying from business for a couple of days on the "spree," then meanly, without acknowledgment, accepting a week's salary for four days' work. I have tried kindness and winking at faults, as I hate changing, but it has been all thrown away.

I do not know how employers who know about the business get on with their assistants, but I, who do not pretend to know much about it, find them the reverse of satisfactory, and am only sorry I am compelled to have anything to do with them.—Faithfully yours, X.

FERROUS-OXALATE DEVELOPER.

Dear Sir,—I find it necessary to correct a formula published by me for the ferrous-oxalate developer, as the oxalate of potash varies considerably: hence the necessity of using a saturated solution. The proportions I gave were 6 drachms of oxalate to 3 ounces of water; it should be:—Oxalate, 1 ounce avoidupois; water, 3 ounces. The iron remains the same.—Yours truly, F. York.

ZINC BROMIDE IN GELATINE EMULSION.

Sir,—With reference to your remarks in your leading article of last week upon the use of zinc and other bromides for gelatine emulsion, will you allow me, as the earliest and latest advocate of its use in this connection, to say that the action you mention, viz., that of destruction of the setting property of the gelatine, was not noticed by me during my trials with it some years ago, though, truly, we did not then "cook" the emulsion before washing.

I wish to show that, granting this charge to be a true one, this need not be a bar to its use; for if the emulsion be made by the oldest method, it may be washed before "cooking," thus getting rid of the baneful effect of the zinc salt.

Again, a method much approved of at the present time is to make the emulsion, and to boil it before adding the gelatine which is to form the vehicle of the sensitive salt; and even then, perhaps, half the quantity may be kept back until after the washing is completed.

I think, then, that it is plain that we need not scout zinc bromide for the reason given. If a very fine state of division is desirable before the boiling process, zinc bromide is the salt to give it. I say, "if," for it is the opinion of some that the bromide may be too finely divided, and that then no amount of boiling will bring it into the proper condition for extreme sensitiveness. Zinc bromide is a good salt wherewith to decide this question; it is, therefore, worthy of a place on the shelf of the experimental "emulsionist."—I am, sir, yours faithfully,

Herbert B. Berkeley.

ON CHLORIDE OF SILVER WITH GELATINE.

Sir,—Having used chloride of silver with gelatine for some considerable time, and noticing your statement last week that you had "not heard of chloride of silver being specially introduced into emulsions," I send two formulæ the result of a great number of experiments with most of the haloid salts, including not only the chlorides, but also the fluorides and cyanides. My experience is certainly against the use of iodide with bromide alone, not that it reduces the sensitiveness, as when used in small proportion to the bromide (say one to fifty) it actually seems to increase the sensitiveness, though as the iodide is increased, so is the sensitiveness decreased, and this holds good with iodide of silver by itself, as a weak solution is very sensitive to light, whilst a strong one is comparatively unaffected; still it acts injuriously by rendering thinner negatives, and there is not that power of obtaining density by the use of a stronger solution of ammonia after the detail is out, than either the plain bromide or the mixed chloride gives. The use of an iodide certainly tends to give clean shadows, and does not show a very material difference in sensitiveness at this time of the year, whilst the violet rays are actinic; but in a month or two, when the yellow rays are abundant, a mixture of iodide and bromide in any proportions will not bear comparison with plain bromide in point of sensitiveness, and by the use of suitable gelatine, plain bromide will give readily shadows of bare glass; therefore the addition of iodide alone is not desirable. There are, however, one or two advantages in the use of certain chlorides with bromide in gelatine, though not with all, chloride of tin, for instance, decomposing gelatine rapidly into clots. All chlorides appear to unite chemically with gelatine, rendering it firmer, so that almost any sample will stand being heated to at least 170° Fah. with impunity; also the development is quicker; there is great immunity from frilling, the image shows plainer when developing, and there are one or two other advantages. The formulæ given show rather small excess of salts, as in my opinion the nearer the exact equivalents are used the better the result, although it is not advisable to use an excess of silver, as this is liable to act on the gelatine and induce fogging.

No. 1.

Gelatine	100 grains
Bromide of ammonium	36 ,,
Iodide of ammonium	3 ,,
Chloride of ammonium	6 ,,
Silver	83 ,,
Water	5 ounces

No. 2.

Gelatine	120 grains
Bromide of ammonium	60 ,,
Iodide of potassium	1 grain
Chloride of sodium	10 grains
Silver	131 ,,
Water	6 ounces

May be made either by taking about five grains of gelatine to the ounce, and boiling for twenty minutes, or the whole of the gelatine may be added at first, and the temperatures kept at about 160° Fah. for a few hours. J. Barker.

GELATINE PLATES.

Sir,—The communication of "Focus Jun." is well-timed, and I hope commercial plate makers will take warning by it. I suspect that photographers generally have not found the change a paying game; they have had to learn at heavy cost from instructors that did not know their book. Not-

withstanding all this, I have to confess that good dry plates are a charm and a gain that put the wet process in the shade.

Having mastered development and modified the light of the studio, making it comparatively a dark room, I can, under all conditions of light, produce better work. But, unfortunately, this is the bright side of the picture; the amount of worry, loss, and bad work from defective plates is something intolerable. I give you one illustration. On Whit Monday I exposed fifty half plates, all of which turned out faultless; on the two following days I exposed twenty-six (a new batch), out of which I lost twenty by frilling in development, or they went to pieces after fixing in the hypo.

Now, sir, I contend that defects such as frilling, fog spots of two kinds, and unsuitable common dirty glass (all of which can be detected by the makers) make it unpardonable that the vital interests of professional men should be so trifled with through preventible causes. W. Hall.

FIXING PRINTS.

Sir,—As no one has answered "Printer's" query in your impression of May 28th, I have much pleasure in doing so. If "Printer" will wash his prints thoroughly between each operation—never use less than four ounces of hyposulphite to twenty ounces of water for each sheet of paper—and take care that his prints never come in contact with hyposulphite, *especially in a dilute form*, until they reach the fixing bath, he will never be troubled with the stains he alludes to.—Yours truly, F. A. Bridge.

Proceedings of Societies.

Photographic Society of Great Britain.

The last meeting of the session was held on Monday, at 5a, Pall Mall East, J. Glaisher, Esq., F.R.S., President, in the chair.

The exhibition of instantaneous shutters was resumed by Mr. Solomon exhibiting a shutter, the invention of Mrs. Payne. Mr. Cadett and Mr. Sands also exhibited shutters.

Capt. Abney observed that of all the shutters which had been shown, none, in his opinion, fulfilled the conditions required, so perfectly as Mr. Darwin's. The best form of shutter was undoubtedly that which opened in front of the plate, as the full exposure of the lens was thus secured. Shutters either in front or behind the lens acted rather as diaphragms, diminishing the quantity of light and lengthening the exposure.

Mr. S. Davis had, some time ago, seen a shutter which seemed to answer Capt. Abney's description. It was somewhat on the principle of a spring roller blind, with a slit either in a horizontal or vertical direction, which could be used according to the movement of the object to be photographed.

Mr. England concurred with Capt. Abney as to the best form of shutter. In the views which he took of Paris some years ago, a shutter opening in front of the plate was used. There was, however, some difficulty in adapting this shutter to the cameras now in vogue for dry plate work, as it was attached to the slide, and it would be rather inconvenient to have a shutter fixed to each dry plate slide where many were in use. He was, however, turning his attention to some adaptation of the kind to be attached to the camera itself, and his experiments were very promising.

Mr. S. Fry pointed out the undesirability of shutters opening by means of a spring, as it gave a vibration to the camera from which the latter did not recover until after the exposure was made.

Mr. Cadett did not consider any advantage was gained by putting the shutter next the plate. He had carefully considered the question, and thought that the shutter might be safely placed either just in front of the lens or behind it. With regard to any loss of light, he was of opinion that with the very great sensitiveness of gelatine plates no apprehension need be had on that point. Mr. Warnerke thought that a picture might be taken even in the 200th part of a second, and he (Mr. Cadett) was now constructing a shutter for that purpose.

Captain Abney observed that Mr. Cadett's observations might apply in cases of extreme rapidity, but where the exposure was, as was generally the case, about the tenth part of a second, the position of the shutter was of great importance.

Mr. Bolas drew attention to a form of shutter which he had purchased some time ago in Paris. The shutter was opened by means of clockwork, and in his hands had answered very well.

Mr. Cadett (who had brought with him a shutter of the kind mentioned by Mr. Bolas) pointed out that the defect of this apparatus was that the exposures lengthened according to the diminution of the momentum of the clockwork.

Mr. Baden Pritchard mentioned, in regard to rapid exposures, the solar photographs of M. Janssen, the time of which was the 2,000th part of a second.

The President, in closing the discussion, hoped that the subject would be resumed at some future time.

Captain Abney then read a paper on "Aids in the Working of the Gelatino-Bromide Process." The principal points of Captain Abney's paper were the removal of fog, and the prevention of frilling. The first he had discovered could be effectually performed by means of bichromate of potash, which, as an oxidising agent, removed all traces of fog, whether in the emulsion itself, or in the plates. Frilling he found could be prevented by pouring over the plate previous to development plain collodion, and washing until greasiness dissappeared. It made no difference in developing, and frilling seemed to be impossible.

Mr. Clark observed, with regard to the second point, that he had produced the same effect by using methylated spirit.

Mr. Bolas then demonstrated a new method of producing duplicate negatives. Mr. Bolas' plan was to first make a gelatine transparency, the lights of which, by immersion in bichromate of potash, became reversed, so that a negative was produced. He found very little difference in detail between the original and the duplicate; for the only thing was that in the latter everything in the picture was changed from the right hand to the left. This, however, would be an advantage in some of the mechanical printing processes by transfer.

A letter from Mr. Hardwich, in reference to the discussion on the magic lantern which had taken place at the last meeting, was then read. Mr. Hardwich reiterated his opinion as to the safety of using the oxy-hydrogen apparatus, but added that he always took the precaution of washing the oxygen in a solution of carbonate of soda before admitting it into the bag.

After some discussion, in which Messrs. Bolas and Cadett took part,

Mr. S. Davis read the report of the committee appointed to consider and award the Paget prize for the best form of dry plates. The report stated that only two competitors sent in examples, one of which was a collodio-bromide, and the other one a gelatino-bromide process. So far as keeping qualities were concerned, the latter was by far the best, both having been submitted to the severe test of a voyage to the Brazils and back. The formula, however, which had been furnished by the competitors contained so few details as practically to give very little information, and an application for fuller particulars resulted in a formula being sent which did not coincide with the details first submitted. Under these circumstances the committee thought the competition should be kept open until September next, and the committee would make a report at the December meeting of the Society.

The report, which was signed by all the members of the committee, was adopted.

The meeting was then made a special one for the purpose of altering the rule which enacted that the subscriptions for the current year should be paid before members could take part in the election of officers. The rule was by a unanimous vote altered, the word "previous" being substituted for "current."

The President closed the proceedings by congratulating the members on the excellent attendances at every meeting during the past session, and on the amount of progress the Society had made, and adjourned the meeting until Saturday, October 2nd, when the annual soirée would be held and the exhibition opened.

It may be mentioned that the last day for sending in pictures for the exhibition is fixed for September 24th. The judges will be, Mr. H. S. Marks, R.A., Mr. H. Moore, R.A., Captain Abney, R.E., F.R.S., Mr. H. Baden Pritchard, F.C.S., Mr. Gale, and Mr. Frank Goode.

South London Photographic Society.

The last meeting before the recess took place on Thursday, June 3rd, in the rooms of the Society of Arts, Adelphi, Rev. F. F. Statham, M.A., President, in the chair.

The minutes of the last meeting having been read and confirmed, Mr. H. Baden Pritchard, F.C.S., and Mr. W. F. Wilkinson, were duly elected members.

The PRESIDENT alluded to the death of Mr. Henry Cooper, who, he stated, was elected a member of the South London Photographic Society in 1863. He could remember him as being then quite a young man, but a most active member. He was not only well known in photographic circles, but had considerable ability as a musician. The President then proposed, and it was unanimously carried, that a letter of condolence be sent to the relatives containing the sympathy of the members on the loss sustained by the death of Mr. H. Cooper.

The PRESIDENT read the following letter from Mr. A. L. Henderson, and was sure that such a generous offer would induce many to exercise their ingenuity and endeavour to gain the prize.

"*To the Secretary of the South London Photographic Society.*

"SIR,— A previous engagement prevents my being present at the meeting to-night. Will you be so kind as to inform the members that I will give a prize of £20 to any one who will within six months publish a method by which a light (artificial) may be used for the preparation of dry plates, *i.e.*, that a single gas burner be used not larger than a No. 5 Fishtail, and that a very sensitive plate may be prepared satisfactorily at a distance not exceeding three feet from the burner, the said plate to remain half-an-hour exposed eighteen inches from the flame without showing any trace of fogging from light.—Yours truly,

A. L. HENDERSON."

The PRESIDENT said he was requested to announce that the forty-eighth annual Exhibition of the Cornwall Polytechnic Society would be held in August. Mr. W. Brooks would be glad to afford any further information to intending exhibitors.

Mr. HAZARD then read a paper on "Gelatine or Collodion—which pays best?" (see page 279).

The PRESIDENT said that Mr. Hazard's remarks seemed so convincing that he was afraid no one would be found to take up the cudgels on the side of collodion.

Mr. DUNMORE said that those who used patent plate would find the wet process useful in using up odd pieces of glass.

Mr. CUTCHEY thought collodion certainly had greater pluck in the negatives than gelatine; but in the hot weather photographers would be in favour of gelatine.

Mr. HOLLYER enquired whether all the photographs taken in so short a time were perfectly satisfactory, because if re-sittings were necessary, it would affect the question referred to in the paper.

Mr. EDWARD COCKING said it became a question in relation to the subject of the paper whether it would pay to bring down photography to such a mechanical and "organ-grinding" state as had been mentioned. From the artistic point of view he did not see how much thought could be given to each, if a hundred sitters were knocked off in the time mentioned; also, with regard to the non-use of the head rest, it might in some few instances be dispensed with, but he agreed with Mr. H. P. Robinson, that with rapid exposures the most perfect rigidity was necessary, as the slightest movement was registered.

Mr. CLARKE said a better and nearly as quick a method of developing was attained by having two dishes, and to let one plate soak in the ammonia and bromide while developing another negative in the other dish; by these means you could give your individual attention to each negative better than developing a number of plates in the same dish.

Mr. FOXLEE thought the silver bath was not quite snuffed out.

Mr. W. COBB said, with regard to the head-rest, he did not use it more than two or three times a week, and then merely as a body-rest, which he found of great use.

Mr. PEARSALL thought the paper had been brought forward in great fairness.

Mr. COWAN said he had known of 100 negatives being taken by the wet process in two hours by subdivision of labour.

Mr. FOXLEE said he remembered, at the time of the carte mania, taking as many as 102 wet plates in the course of one day during the month of October.

Mr. F. A. BRIDGE used collodion for copying, and gelatine for portraiture.

Mr. BROOKS used gelatine for copying, which gave much finer results; although he had been a staunch advocate of collodion, wet and dry, he had some time ago exposed two gelatine and two collodion plates on the same view, and he was bound to say the gelatine was far in advance of collodion. Mr. Cutchey had remarked upon the flatness of gelatine for landscape, but in his opinion, if a landscape were properly lighted, gelatine gave the best result.

Mr. DUNMORE made a few remarks, and exhibited several photographs (see page 281).

Mr. EDWIN COCKING said, with regard to the subject of short and long exposures on gelatine plates, he had been recently told by an amateur that to a subject including some dark foliage and very light flowers with sunshine across the view, an exposure of two minutes with a whole-plate symmetrical lens had been given, and by judicious development a negative good in all parts was the result.

Mr. F. HOWARD remarked that details in the shadows of gelatine negatives seemed lost in the printing; could this not be altered in some way, as the print was not so good as the negative?

Mr. C. G. CUTCHEY then read a paper on "Optical Lanterns" (in our next).

Mr. BRIDGE said he had had great experience with lanterns, and in competent hands, either with the mixed or the blow-through, jets were perfectly safe; he preferred the mixed jet, as it gave more light when a large disc had to be shown. Carelessness he considered as the sole cause of accidents.

Mr. BROOKS said he used back pressure valves, with which there was no danger; he also preferred the mixed jet, the blow-through using such a quantity of gas.

It was proposed by Mr. C. G. CUTCHEY, and seconded by Mr. E. COCKING, "That this year 1880 being the twenty-first anniversary of the Society, and also of the presidency of the Rev. F. F. Statham, a dinner be given to him by the members in celebration thereof on the last Saturday in July." Mr. CUTCHEY was sure that every member would endeavour to be present. The Committee would arrange time and place, and the Secretary would give notice of such arrangements to every member.

Rev. F. F. STATHAM said he was very much surprised on reaching the committee room some short time since to find that the above resolution had been passed; it certainly was the twenty-first anniversary of the Society, and also of his Presidency. When he first became acquainted with the Society his knowledge of photography was very small—limited, indeed, to being a very patient sitter to Mr. Shadbolt, one of the originators of the Society. He (Mr. Statham) should be only too happy to meet the members to celebrate the coming of age of the Society.

The CHAIRMAN then said he had been requested to state that some of the members and others had been in the habit of meeting lately on Saturday afternoons to spend an hour or two with the camera; any one wishing to join them could receive notice of where to meet from either Mr. Brooks or Mr. Bolton. He (the chairman) had also to announce four titles for the monthly competition during the recess, viz.,—"Under the Greenwood Tree"; "By the Sad Sea Waves"; "A Bit of Sunshine"; "Mischief."

FRENCH PHOTOGRAPHIC ASSOCIATION.

A MEETING was held on the 7th ult., M. PELIGOT in the chair.

M. PERROT DE CHAUMEUX stated that M. Campo, travelling in Australia, has reported that his gelatine plates had undergone no alteration by change of climate, having suffered no injury either by crossing the Equator or afterwards lying a whole night covered with snow on the Blue Mountains. Warnerke's emulsion plates, on the other hand, were not so favourably spoken of. He deplored the absence of a suitable light for the development of gelatine plates, and the difficulty in the preparation of them.

M. GUSTAVE RE, like Mr. Woodbury, wished to discontinue the use of the hydraulic press in the photo-relief process. According to his plan, the gelatine relief is cemented, by means of india-rubber dissolved in benzine, to a glass plate; over it is placed an iron frame of the size of the required proof, from two to four centimetres in height. Into the cavity thus formed, a piece of tin-foil is pressed with a hard brush into the relief. A mixture of eight parts of plaster and one part of calcined alum, both finely powdered, is next put in, and by aid of an ordinary copying-press is squeezed until the cavity is three parts full. As good plaster absorbs about 16 per cent. of water, the necessary proportion of water, in which is dissolved three or four per cent. of strong glue, is poured over the compressed plaster, and is again submitted to pressure. The plaster, in absorbing the water, increases in bulk, and forces itself into every crevice of the mould. A chalk mould is thus obtained, which can be used similarly to those formed by means of the hydraulic press.

M. PELIGOT suggested that an amalgam of copper and mercury used by dentists might be employed.

M. FLEURY HERMAGIS showed a new iconometer, the construction and functions of which he explained. It is composed of

two lenses, their curvature being calculated to lessen apparent distortions. The objective, plano-concave, is very large, in order to take in the whole view at short focus; the eyepiece is the size of an ordinary eye-piece, so that the optical axis may correspond with the eye. The tube containing the lenses is inserted in another, larger and conical in shape, its lower and wider extremity being covered by a metal plate having a rectangular opening. This aperture limits the extent of the field of vision, and varies as the glass approaches to or recedes from it. By means of marks on the slide, one is able to regulate the view seen by the eye with that taken up on the objective. The eye-piece is tinted blue, as that colour has the effect of reducing the varied hues of a landscape to a monochrome, enabling the observer to judge of the effect of a negative.

M. Perrot de Cheumaux exhibited in the name of M. Duchene a new mineral oil furnace.

M. Stebbing next read a paper by Mr. Woodbury on his present mode of working the photo-relief process.

M. L. Vidal observed that the great advantage of this process was the perfect evenness of the mould.

M. Petit described and exhibited specimens of a new process of phototype, called similigravure.

M. Jubert presented a new shutter for instantaneous views.

A collection of retouching pencils of fine graphite were presented by M. Gilbert.

M. Favre showed several coloured prints, and explained his method of tinting. He used carbon prints, applying colour only to the features and then coating with gelatine. When thoroughly dry, the larger washes of colour are laid on. Should the tinting prove unsatisfactory, it can be removed without injury to the print, while a much fresher and more brilliant result is obtained by reason of the gelatine surface.

Talk in the Studio.

The Royal Visit to Truro.—We are glad to hear that Messrs. Thomas, Williams, and Co., of Plymouth, were successful in obtaining two instantaneous views of the laying of the Cathedral stone, upon gelatine plates; the plates measured twelve by ten inches, and, notwithstanding their brief exposure, developed with plenty of detail.

The Tableaux Vivants at Cromwell House.—Mr. Van der Weyde desires us to state that this fine series of pictures, of which a selection was published in the *Illustrated London News*, were taken under his personal direction, and only members of his own staff were present on the occasion. Mr. Fry's plates were employed, and that gentleman developed some of the negatives, but he was not present at Cromwell House.

The Toy Symphony Group.—Mr. F. A. Bridge tells us that his "Toy Symphony" picture was taken in a room with a central skylight only, and that it was necessary, therefore, to arrange a series of reflecting screens in order to secure a good result; notwithstanding these difficulties, four negatives were taken in fifteen minutes. The musicians in the group number nineteen, and Mr. Bridge assures us that none of them objected to being photographed, a circumstance we can well believe, since otherwise they would not probably have sat. The picture is sold for the benefit of the Children's Hospital, an institution, we are glad to hear, that is likely to be considerably benefited thereby. Mr. Bridge seems to have coped very successfully with a difficult subject.

To Correspondents.

A Photographer who writes in a singularly feminine hand wishes to know what are the duties of a lady in the reception room. We have taken the question as a text for our "Topic" next week, when we hope our correspondent will be thoroughly satisfied with the information.

C. A.—The cost and difficulties of construction of larger lenses increase very rapidly, to the extent, it may be said, with the squares of the diameters of the lenses. 3A cannot, of course, cover to the extent of 4A. Straining the lens in the manner you describe destroys the perspective in a picture, while, moreover, the curvature of the field would be very visible, causing indistinctness at the margins; these resulting defects are explained by the fact that the focus of the lens is too short. If you study "conjugate foci" in your handbook you will find the law clearly expressed; by halving the distance between object and lens, you approximately double the size of the image in the special instance you name.

H. Wilson.—Thank you.

Hypo.—1. Friction with another burnished surface is the only way to remove scratches; burnishing tools of this kind are to be bought of every shape. 2. We have had no difficulty in removing the marks from your print; there must surely be dirt on your burnisher. 3. We do not know what toning baths you have been using, but you must remember that the finished appearance of the print is always dependent upon the nature of paper employed. Don't tone too much, and try the following simple formula, which will work better when not quite new, viz:—

Distilled water	8 ounces
Chalk	20 grains
Chloride of gold	1 grain
Chloride of lime	1 ,,

Bamboo Stand.—We will get the information for you.

Luminosa.—Ihlie and Horne, 31, Aldermanbury. You cannot make it.

Vitro-Enamel.—You will find articles on the subject of enamels in the News of Feb. 1, 8, and 15, in the year 1878.

J. W.—Tone a little more deeply. Are you quite sure you have enough gold in your toning bath, or that it does not contain much acid?

D. A. K.—A warm sponge and water applied immediately is the best means; you will injure the cloth by reagents. In the case of silver stains, these generally disappear on being rubbed first with a solution of iodine and then with hyposulphite, a final rinsing in water following the operation.

Hope.—1. See answer to "J. W." 2. The smoky look probably comes from your intensifier; see if it occurs in a plate that has not been intensified. If so, you must modify your solution. 3. If you have a good paper, print deeply, and do not carry toning too far; you should then have no difficulty. We could cite two or three good toning formulæ, but probably none better than you have already.

W. X.—1. Afterwards. 2, 3. HB pencil with a very fine point generally answers the purpose. 4. Yes, we should think so. 5. Two or three light touches. 6. Dry.

W. D.—Your note was sent on by us, and the answer given you was by the author himself. You must remember that the added gelatine absorbs a good deal of water, and this you do not seem to have taken into account.

Carl Norman.—We have received negatives and will examine them.

R. Gordon.—Our Publishers state that they have not your address; will you send it them? We have not seen the group yet of which you speak.

Cabinet.—We will consider the matter you speak about and write again. Johnson and Matthey, of Hatton Garden, can let you have the iridium salt for toning, and any photographic dealer would procure you the powder.

A. Herbert.—We will make enquires on the subject of your complaint; it certainly must be an oversight. You shall hear from us.

J. M. W.—The film you send is fine and delicate enough, and there is no trace, on careful examination under a magnifier, of crystallization. Without following your work, we could scarcely give an opinion. For ourselves, we frankly say we do not like the method of preparation you mention, as a further element of uncertainty is introduced. You will find Mr. William Bedford's formula very good; we prepared some good emulsion this week by following his instructions.

A Countryman.—1. They are not known. 5. The stops are so arranged that counting from the largest (No. 1), the next size smaller (No. 2) requires double the exposure, with the exception of those marked with a cross, which require only half as long as the preceding larger stops, thus:—

No. 1 stop equals 10	seconds
No. X stop equals 15	,,
No. 2 stop equals 20	,,
No. 3 stop equals 40	,,

We think your best plan would be to rule your own note-book; every one wants his own particulars.

Alpha.—We should not advise taking the positive on opal, from the liability to stain, and the great uncertainty of cleaning the image out of the glass in case of failure. If required, it should be taken in the ordinary manner, and toned with gold, adding a saturated solution of bichloride of iridium and potassium in the proportion of two drams to a pint of gold bath. It would, however, be much better to take the positive in the usual way, tone it in the above bath, then immerse in weak sulphuric acid—half dram to a pint of water—draw a line with a needle about the eighth of an inch from the edge of the plate (all round), leave it until it comes away, lift gently out of dish, and put in another filled with clean water to get rid of acid; then place a piece of tracing paper a little shorter than picture on the film (under water) about another eighth of an inch from top, turn the edge of film over on to paper with a camel's-hair brush, lift the plate out of water, when the paper carrying the film may be raised carefully off the glass and placed on opal plate.

The Photographic News, June 18, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHY AT THE GREENWICH OBSERVATORY—SOLAR PHYSICS—PHOTOMETER OR ACTINOMETER.

Photography at the Greenwich Observatory.—At the recent visitation a report was presented to the visitors, who consist of the Presidents of the Royal Society and Royal Astronomical Society, and the astronomers who hold official positions at Oxford and Cambridge. In the twenty-one pages of printed matter, we find that photography still holds its own as an aid to the scientific work carried out there. We learn that between May 20, 1879, and May 9, 1880, photographs of the sun were taken on 145 days, and that 270 of these have been selected for preservation. The photographs show a complete absence of spots on 64 days of the 145, while in the preceding year there was a similar absence of spots on 121 days out of 150, and, as the Astronomer-Royal remarks, the minimum of sun spot periods appears to have been about the beginning of 1879, as since October last the outbreak of spots has been very marked. Those who had the privilege of "entrée" to the Observatory on the 5th June would also have been able to see that photographs of the spectra of spots had been taken on many occasions to enable a comparison to be made between these and the ordinary solar spectrum; the only fault that could be found being that the old pyrogallic acid developer and wet plate process were employed for obtaining them. The "new gelatine plates," we are told, were quite unmanageable, owing to their excessive rapidity. It need scarcely be said, also, that the photographic registration of the barometer and thermometer and magnetometer are carried on in the same excellent manner as it was under Mr. Glaisher, and in process of time the photographic curves must yield something which will be of importance.

Solar Physics.—In our last issue we drew attention to this subject, and pointed out what a certain Fellow of the Royal Astronomical Society had written regarding it. For the sake of fair play we have consulted the estimates, which throw light on the other side of the question. We first find that the sum drawn from the Treasury, to commence with, is not a very large one—only £500—and that none of this finds its way into the pockets of the committee except a small amount for the travelling expenses of two members who live at a distance; the remainder is appropriated to what may be called the literary part of the job, and to the payment of an assistant for making reductions. Now we have a great respect for Lord Lindsay, but, like other folk, we take our own estimate of his opinions. They may be sound, or the reverse, but that there *is* a doubt as to them is shown by the fact that the committee are on friendly relations with other astronomers who have not thus condemned their labour. For instance, in the report of the Astronomer-Royal, already referred to, we find this remark:—"Various spectroscopic and photographic results are communicated to the committee on Solar Physics, with whom we are in friendly communication." If the Astronomer-Royal agreed with Lord Lindsay, we can hardly see how he would have acted as he has. Regarding "F.R.A.S.," the contributor to the quasi-scientific journal, we have but little to say, as he is rather fond of calling names. "It is all very well to call a spade a spade," said a friend to us, "but it is going a little too far to prefix an epithet unparliamentary to it," and so we say. There seems to be one locality, and two or three men of science, whose very names act very like a red rag to a bull, and the grain of salt has to be a very large one before we can sanction anything but a very small modicum of what he writes when they are brought into it. We greet this subject with one remark, which is, that if any considerable number of men of science think there is anything in "solar physics," the sum expended will not ruin the nation, and perhaps will be as profitably employed as much of the secret service money annually voted. If there is nothing in the study of the sun, it will soon be found out, and we do not grudge a committee who perform gratuitous labours under a Government department the small amount of prestige which attaches to them for so doing.

Photometer or Actinometer.—Pending the advent of the Warnerke actinometer, we have had resort to a method of photometry which has given us very fair ideas of exposure necessary during a day's photography. We covered a strip of glass with squares of a varying number of thicknesses of tracing paper, beginning with three, and ending with fifteen or sixteen. Black figures were painted in these squares corresponding to the thickness of paper. We then made a pasteboard tube of some eight inches in length, and about three-quarters of an inch high and wide. About an inch from one end we cut two apertures, through which the strip of glass would slide. When attempting to expose views differently lighted, we held one end to the eye and pointed the other end, carrying the glass, to a point having a medium illumination, and moved the strip till a square was reached, through which the number on the tracing paper could not be read. This we noted, and from comparing this number with that obtained by an open view a very correct estimate was obtained of the exposure necessary to be given. In one case we had a view on the Thames illuminated with bright sunlight to take, and knew that five seconds with a collodion emulsion was sufficient exposure to give; whilst another view was a road shaded by tall over-hanging trees, the exposure for which seemed difficult to guess. The photometer, which had previously been "scaled," showed that the exposure required was fifty seconds, and this we judged by "taking a sight" at the shadows in the middle distance. On our return home the estimate arrived at proved correct, and we had a fully-exposed picture. It is needless to say that in many instances the method might prove fallacious, since the light may be much yellower one day than another, and then much must be left to the judgment of the photographer, the very point which a good actinometer should avoid. In all actinometers there will be one drawback, and that is, that although they will measure the general light from the sky, yet they will not show the general brightness of any particular view that has to be taken. Perhaps a Warnerke actinometer might be provided with a lens slightly out of focus, so as to give a general light, and this might be directed towards the part of the view which would require the most exposure. This would confer a boon on many photographers whose judgment is often at fault in regard to this point. It is the usual plan to judge of the exposure by observing the image on the ground glass of the camera, but there is great liability to err, and something even now seems to be wanted to render a photometer of absolute use. For printing purposes, of course, there is not the same difficulty, since an exposure of the actinometer to the same light as the print should give certain results. Who will help us in this matter? Our own photometer is but a makeshift.

PHOTOGRAPHS BY LIGHTNING.—The correspondent who sends this wonderful account, notes that it comes from America. The *Charlottesville Chronicle* says:—"We have heretofore published an account of a portrait supposed to have been photographed by lightning on a pane of glass in the window of an old farm house in this county. Another instance of the same curious phenomenon has been found in the window of the mansion house on the Mount Eagle farm. The portraits of four persons are plainly discernible; the faces are not all on one pane, and the theory is that the party were all looking through the window during a thunder-storm, when a sudden flash of lightning, by some mysterious process, instantaneously fixed their features on the glass."

At Home.

M. NADAR IN THE RUE D'ANGOU ST. HONORE.

In the dark days of the Paris siege in 1870-71, when the fair capital was encircled for nearly six months as by a girdle of iron, two photographers brought hope and comfort to the besieged citizens. The one, M. Dagron, showed with what rapidity and facility despatches were to be photographed upon pellicle, and in such a way that a pigeon could carry a thousand of them at its tail; and the other, M. Nadar, as captain of a balloon equipment, demonstrated how aerial photography could be practically applied for scouting. "A la nouvelle de l'approche de l'armée Prussienne," we read, "sous les murs de Paris, M. Nadar organisa à Montmartre le premier poste de ballon captif pour observer l'ennemi."

In the words of our neighbours, MM. Dagron and Nadar deserved well of their country, and although their brother citizens would wish to forget as speedily as possible those anxious hours of misery and bloodshed brought so vividly home to them, they still remember with gratitude the aid which these gentlemen brought at a time of dire distress. It is an ill-wind that blows no good, and among other lessons that the siege of Paris taught was that a regular "poste aérienne" could be established now-a-days by the aid of photography and balloons, and that the latter, moreover, afforded an excellent means of observation or reconnoitring for an army in the field.

Our host, the captain of the aerial scouts, in the red blouse in which his stalwart figure is usually attired "at home," presents a handsome figure enough; M. Nadar is still in the prime of life, his fair brown moustache and bright eyes conveying the idea of strength and determination, while his broad shoulders tell that he can both do and dare. His aerial photography experiments, he tells us, have cost him 30,000 francs; he considers the problem, however, practically solved, and if his balloon pictures are not perfect in every respect, they require but little more attention to detail to render them so. But one fine example, we may say at once, leaves little to be desired. It is a picture to which the late Sir Charles Wheatstone referred us on one occasion, during a discussion upon aerial photography, as the best result of its kind. Balloon photographs are very rare, and besides those of Nadar, we only know of one tolerable success, namely a picture of Boston, U.S. The pictures of M. Nadar were secured upon three-inch plates with the briefest of exposure, and have been enlarged to something like twenty inches. The most successful of all, of which we have spoken, was secured at a height of 320 metres. There is, of course, something of a haze, due to the flood of light, but we see the main buildings of Paris and the heights around with map-like distinctness. To the extreme right, in just a corner of the Arc de Triomphe, there is the Eglise Russe, and the Parc Monceaux, with twenty spires and domes that a Parisian would recognize and call by name. Great difficulty was experienced in overcoming the gyrations of the balloon, but, after all, it is rapidity of exposure, according to M. Nadar, that is the key of the problem.

The Nadar establishment is a very extensive one. Passing through the corridor you enter a fine square hall, which probably measures forty feet each way. Here are pictures of Paris, under the earth and over the earth, the former representations of the famous catacombs secured by electric light. M. Nadar junior was good enough to accompany us on a tour of inspection, and chatted affably over prospects of photographers and their position. The carte panneau—the panel portrait—was already in such requisition at the Nadar establishment that quite one-third of the work done was in this form. Besides this new format, there was the carte Nadar, a very large and handsome format, about the size of two panel portraits placed side by side. The price charged for panel portraits was 120 fcs. the dozen, while as much as 200 fcs. per dozen was asked for the carte Nadar. Thirty francs, for which the sitter received fifteen cartes-de-visite, was the lowest fee charged.

To ascend from the magnificent entrance hall, a lift is provided, which takes the visitor to the dressing rooms and studio. The former are tastefully fitted up, and the studio is large and lofty. So lofty, indeed, and so much light is there, that blue curtains are stretched across at some distance from the roof to lessen the illumination. These blue linen curtains are strung on wires, so as to be manipulated with ease. There is very little skirting board or wainscoting, the side window coming down very low. They like dark backgrounds at the Nadar establishment—those we saw were all of a blackish drab—and to prevent the flooring being seen in a standing portrait, or the line of the background where it touches the floor, sand is thickly strewn about. The effect of the latter was remarkably good in the panel portraits we saw.

M. Nadar fils discussed with us at some length the difficulty of securing talented assistants. It is not a question of money at all, he assured us; good competent photographers, who are artists as well, could command high prices. The pay of assistants *du premier rang* was 500 francs per month (£240 per annum); but he knew a case—an isolated one, it is true—in which *mille francs*, or double the above amount, was paid. In the principal studios in Paris, Vienna, and Berlin there were assistants of all nationalities. But while the Germans, some time ago, by reason of their skill with the retouching pencil, were to the fore, the Italians now seemed to be making way. These rates, of course, only referred to first-class men, but they were such as well-known studios paid. Unfortunately, the number of talented assistants available was very small, for he who secured a good man took care never to lose him again. A percentage on the profits, or sometimes an offer of partnership, was necessary to retain him. The studios of Vienna, Paris, London, Berlin, &c., in the first rank were, after all, not very numerous, and consequently you might tell the number of competent assistants upon your fingers.

As to photographic apparatus, said M. Nadar fils, touching upon another point, you have it all your own way in England. "I am coming to London in a little while, and for no other reason than to purchase instruments and apparatus." "But don't you find our apparatus rather more expensive than what you buy on the Continent?" we naturally asked. M. Nadar did not think so. "Your work is so good, that it always pays to buy it." So our opticians and camera makers need not despair yet, and we hope sincerely that they may long continue to enjoy the same reputation. That they have been in the van for years past is well known. Ten years ago, when on a visit to Dr. Vogel in Berlin, we well remember the ecstatic delight with which one of the worthy doctor's pupils spoke about the new camera that was coming all the way from England. We often think of him now, when we see the shining mahogany and its brass and ivory fittings, and wonder if our sanguine friend in Germany was satisfied with the apparatus which gave him so much anticipatory pleasure.

The Nadar establishment is singular for the fact that no *cartes émaillées* issue from the premises, a style, as we have before remarked, which is still exceedingly popular in Paris. For the glaze and embossing, the public are quite willing to pay half as much again, and thus both customer and photographer join hands. But M. Nadar is evidently bent upon pushing the panel picture instead, and as the portraits of a large number of celebrities have recently been published in this form, it is daily growing more and more popular. At the same time, 120 francs is not an amount that all the world and his wife is ready to pay; although it always seems to us that a sum that visitors grudgingly give at home is freely disbursed in the French capital.

Those who visit the Rue d'Angou will say that M.

Nadar has given up the command of his war balloons to some purpose. He seems to be quite as successful in his peaceful pursuits here, as when scouting in the air with the Prussians, at the walls of Paris—as good a man behind the camera as before the enemy. Not only does the Nadar establishment take high rank at present, but it seems destined, before many years have passed, to come even more prominently forward as one of the principal ateliers of the French metropolis.

The "At Home" next week will be "Mr. J. W. Swan at Newcastle-upon-Tyne."

HINTS ON RETOUCHING.

BY J. E. WALKER.

It is my desire to set down a few simple rules as a guide to the art of retouching, which, if carefully followed with judgment on the part of the student, will enable him to retouch a negative with a little practice, and not to spoil the effect of the resulting positive by doing the modelling *not wisely, but too well.*

The student will require an easel for holding the plate in such a manner that no light is admitted to him, except *through* the negative. These may be purchased ready-made at any respectable dealer's for the size of plates you require to work; it should not be less than twelve inches square.

It is also an advantage to use a piece of black or brown paper, with small opening in it, about the size of the face you are retouching: it is then not so glaring to the eyes.

First procure several good drawing-pencils of any good makers; they must be as free from grit and as fine and smooth in the lead as possible, and as these are not expensive, you should get the very best pencils that are made. (I prefer Faber's make to any other.)

These will be found the most useful grades—HB, HF, BBB. To prepare these pencils, cut the point with a sharp knife, leaving the lead bare for about half-an-inch; then finish the sharpening by rubbing it on fine emery-paper until you have a point almost as fine as a needle, then finish off on a piece of drawing-paper.

Now take your negative to be retouched, and proceed to give it the necessary "tooth" or "bite" for the point of the pencil.

There are several good varnishes and mediums sold for this purpose. The parts about to be retouched may also be rubbed with a little fine powdered resin, pumice-stone, or cuttle-fish powder; bicarbonate of soda will also give a rough surface to the varnished film, but it should be carefully removed, as it is apt to injure the negative if not taken off with a dry brush.

For a good hard varnish I have found the following proportions make a useful medium :—

Resin	... ...	½-ounce
Turpentine	... ...	2 ounces

Shake well until all the resin is dissolved, moisten the parts about to be worked upon with a drop from the stopper of the bottle, then remove by gently rubbing in a circular motion with a small piece of flannel until it appears to be all gone from the surface, then it is ready to commence work upon.

Now to commence work: first carefully examine your negative and see what is required to be done; take your HB pencil (soft and black), and with it very carefully, and as neatly as possible, fill in all the transparent spots and marks that are most prominent and striking to the eye; this is the first stage, and is a rough kind of stippling or filling in; it is best done by gently pressing the point of the pencil on the centre of the spot or place to fill in, and turning the pencil slightly round. This leaves a small particle of lead on the place; commence at the top of the face, from the high lights or most opaque parts, working gradually down to the chin.

The face will now look smoother. Now take the H pencil (hard) and go over the face in the same manner as before, taking out all the less transparent or semi-transparent spots and lines and other defects; this properly done, the face will look in this second stage a great deal smoother, but rather flat, especially if the lighting be not so good as might be. For the third and finishing stage of the work, take the HF pencil (fine), and this must have a very smooth fine point; now, with this fine needle-like point, go over the whole face, not as before, but with a *free light touch*, working in fine lines; let these lines cross and fill in all the finer work, giving softness and roundness or relief to the features, until the face has a smooth, even texture, like a fine steel-engraving. If the face be flat, strengthen the high lights with a few well-rounded bold lines; also the light on the nose may be heightened a little by drawing a line down it, terminating with a spot of light at the end. Above all, do not overdo this part and make it look like a white streak. If care be exercised here, a very flat negative may be *built* up and made to give a good print.

I must here caution the beginner not to overdo it—rather not do enough than too much, and remove the character from the negative and falsify Nature, for there is more art in knowing when to stop than when to begin.

The principal rule to be observed in order to become a good retoucher is, to remove the defects without showing how they were removed—that is to say, remove that which destroys the beauty of the picture, but leave no marks behind you to show you have been there at all; and, to preserve the character and likeness of the sitter as much as possible, and also in modelling the face, always work with a light, free, and artistic touch.

With very flat under or over-exposed negatives, varnishing the back with ground-glass varnish, and with the BBB pencil, and sometimes a stump filled with lead scraped from the pencil, you may put in lights in face, hands, and draperies; this, working on the back of the plate, prints very soft; with a sharp knife remove the varnish from the shadows and places required to print dark. In this way the retoucher may work wonders with a negative; *but don't do too much.*

ON THE ESTIMATION OF THE EXPOSURE WITH DROP SHUTTERS.

BY W. R. GOWERS, M.D.

The time of exposure with an ordinary drop shutter may readily be estimated by means of a tuning-fork. If the time of vibration of the tuning-fork is known, and this is made to record its vibration on the falling shutter, the period of exposure with any size of opening may at once be ascertained.

The method I have employed is the following:—Smoke a strip of albumenized paper by means of a candle, taper, or piece of camphor, and fix the strip, by its extremities, to the movable part of the shutter, with gum or sealing-wax. Cut a small point of cardboard, and fix this, by sealing wax, to one extremity of the tuning fork. Having set the tuning fork vibrating, bring the point in contact with the lower part of the smoked paper, and allow the shutter to fall. The tuning-fork will be found to have traced upon the paper a wavy line, each wave corresponding to a vibration. The waves are near together at the commencement of the line, in consequence of the slowness of the initial motion, but are further apart as the motion becomes more rapid. Since the commencement of the exposure does not correspond to the commencement of the fall, we must measure the distance; the lower edge of the opening in the shutter is above the opening of the lens (when the shutter is in position), and mark off a corresponding portion from the lower extremity of the

race, and then commence our measurement; any tuning-fork, the vibration of which is known, will answer. An A tuning-fork is a convenient one to employ. This vibrates 427 times per second. Roughly speaking, then, every four waves of the tracing corresponds to 1-100th of a second. Make a mark on the smoked paper, at every fourth complete wave, and then mark off corresponding distances on the shutter at the edge of the opening in the movable part.

The opening is thus graduated in hundredths of a second, and the slide in the shutter can be readily moved, so as to afford exactly the exposure which may be determined on.

Shutters are made by some (not all) makers with the slide, which alters the size of the opening above. It should, of course, be below, at any rate, if constructed so as to give a fixed minimum of opening. If the minimum opening is below, the minimum exposure will be found to be five or six times as great as in a corresponding opening above, in consequence of the slower rate of movement at the commencement. The tuning-fork shows that the chief acceleration takes place in the first third of the movement, the rate during the second half of the movement being comparatively uniform.

A MODIFIED PLAN FOR DEVELOPING GELATINE PLATES.

BY W. BOVEY.

MY enthusiasm in photographic research having lost the sanguine impulse of youthful ardour, I am humbly content to introduce my present mode of developing gelatine dry plates as a modestly slight modification of the generally adopted method, inasmuch as I discard the use of bromide, and regulate the amount of pyrogallic to suit exposure and the quality of the gelatine plate. As is, unfortunately, too frequently the case, gelatine plates lack uniformity.

With plates that are prone to over-intensity, I reduce the pyrogallic as low as one grain to an ounce of water. For thinly-coated plates I use five or six grains of pyrogallic to an ounce of water. To reduce the matter to rule, however, I will imagine the plate perfect in all respects; in such case I would prepare my developer as follows:—

Pyrogallic	about 2 grains
Water	1 ounce

Exposure—about one-tenth the time required for an ordinary wet collodion plate. After exposure, place the plate in a dish larger than the plate. For a 7½ by 4½ inch plate, I use a 10 by 8 glass bottom dish or tray. Flood the plate with the pyrogallic solution, then tilt the dish to collect the solution at one end. A few drops of ammonia solution prepared as follows must now be added.

Ammonia fort.	2 drachms
Water	8 ounces

The highest lights will shortly appear; these must be permitted to obtain some force before adding more ammonia to bring out the middle tones and details of shadows. The image should appear with exaggerated intensity as seen by reflected light, but care must be taken that in this state gradation of strength is duly preserved. A few trials would suffice to enable the operator to control the development. Keep the pyrogallic in excess, and guide with gradual additions of ammonia, which in weak solution can be used without fear that a drop or two more or less can do much harm.

I intensify weak images, when such chance to turn up, with B. J. Edwards's excellent formula, to which I add quite half more of hyposulphite than he recommends. This addition makes the intensification controllable, and the colour it yields resembles that produced by the less reliable pyrogallic re-developer.

I have given the plan as above stated to several of my customers and other friends, who are unanimous in praising its simplicity and comparative certainty in correcting varied exposures. In the hope that my readers might benefit from the information also, I gladly add my mite to the fund which has been contributed to so liberally by admirers of gelatine dry plates.

In conclusion, I will briefly describe a mode of preparing a non-actinic medium which has cheapness and thorough reliability to recommend it for general use—stout orange-coloured paper, sold at one penny per sheet, brushed over one side with a liberal coating of aurine, then dried. Mix sweet oil with paraffin, in equal proportion. Rub this well into the paper with a piece of flannel, and you have a semi-transparent medium, by which dry gelatine or wet plates may be developed with safety.

OXALATE OF IRON IN PRINTING PROCESSES.

BY M. L. DE KONINCK.*

AMONG substances which can be acted on by light, ferric oxalate is one which possesses valuable properties, especially those of cheapness and sensitiveness. The difference in the re-action of the ferric and the ferrous oxalates on ferrocyanide and ferricyanide of potassium produced by the influence of light on the ferric salt has already been taken advantage of; but the processes depending on this reaction, though they are capable of rendering good service in the reproduction of maps and and linear drawings, cannot be used in ordinary photography on account of the blue colour of the prints. Attempts have, however, been made to obtain prints, more or less black, by means of the oxalates, and thus has been discovered the platinum process.

I do not know myself the details of the process, but the theory of it may be given in a few words. A ferrous salt in the presence of potassium oxalate precipitates from a hot solution platinum and the chlorides of that metal. The reaction is seen in the following equation:—

$$\underbrace{12FeC_2O_4}_{\text{Ferrous Oxalate}} + \underbrace{3PtCl_4}_{\text{Platinum Chloride}} = \underbrace{4Fe_2(C_2O_4)^3}_{\text{Ferric Oxalate}} + \underbrace{2Fe_2Cl_6}_{\text{Ferric Chloride}} + \underbrace{3Pt}_{\text{Platinum}}$$

Some experiments, which I have made in conjunction with M. Laoureux, gave us prints grey in tone, and wanting in delicacy. The latter fault was diminished by substituting for potassium oxalate a solution of the double tartrate of sodium and potassium (Seignette salt) rendered alkaline by the addition of a little caustic soda. This effect it is not difficult to understand, for it is well known that salts in an alkaline solution have a much greater reducing power than in an acid or neutral solution. The reduction of the platinum is consequently effected much more rapidly, and, if I may so express myself, more *in loco*, before the ferrous oxalate has time to dissolve, or at the exact moment when it begins to enter into solution.

It is not alone the salts of platinum which are capable of furnishing permanent prints, for they can be produced also by those of gold, and that, with even great facility. For example, if a piece of paper impregnated with ferrous oxalate of sodium be exposed beneath a negative, on being dipped into a cold solution of chloride of gold the image will appear at once, in consequence of the reduction of metallic gold:—

$$\underbrace{6FeC_2O_4}_{\text{Ferrous Oxalate}} + \underbrace{2AuCl_3}_{\text{Chloride of Gold}} = \underbrace{2Fe_2(C_2O_4)_3}_{\text{Ferric Oxalate}} + \underbrace{Fe_2Cl_6}_{\text{Ferric Chloride}} + \underbrace{2Au}_{\text{Gold reduced}}$$

By washing the print in pure water it is then fixed. The prints in gold thus obtained have a violet tint; they may be intensified to any desired extent, but, like those in platinum, they are wanting in delicacy, the more so

* *Bulletin de l'Association Belge.*

that, judging from some of my laboratory experiments, only paper of a certain thickness, whose substance is not too close, gives satisfactory pictures.

There is another reaction of the ferrous salts, which I have essayed to apply to photographic printing; I mean that produced by them on a hot alkaline solution of bismuth. If nitrate of bismuth be dissolved in a solution of salt of Seignette to which a little caustic soda has been added, and a solution of a ferrous salt—the oxalate, for instance—be introduced boiling hot, a dense precipitate of oxide of bismuth ($Bi_2 O_2$) of a magnificent black colour is immediately produced. In my attempts to make use of this reaction for photographic purposes, however, I have not yet met with success.

THE ALKALINE DEVELOPER.

In a letter to the Photographic Society of France, M. Ad. Clavier, of Setif, in the province of Constantine Algeria, advises a slight modification of the alkaline developer. He proposes two solutions:—

A.—Water	...	100 grammes
Ammonia bromide	...	0.20 ,,
B.—Concentrated ammonia	...	100 ,,
Ammonia iodide ...	...	0.40 ,,

When the atmospheric temperature is high, a larger quantity of iodide should be used; in what the author calls siroca weather, as much as two grammes of the salt can be tried with advantage.

For developing, just so much water as will cover the plate is poured into the dish, and a few drops of the solution A are added. While the plate is soaking in this, the developer is prepared, consisting, for half a plate, of the following:—

Water	...	40 grammes
Pyrogallic acid ...	...	0.20 ,,
Iodised ammonia (B) ...	...	1 or 2 drops

In about from five to ten minutes the image appears, and acquires gradually the required degree of intensity.

MEASUREMENT OF THE ACTINISM OF THE SUN'S RAYS AND OF DAYLIGHT.

BY DR. R. ANGUS SMITH, F.R.S.*

When examining the air of towns and the effect of smoke and fogs, I have often wished for a very simple chemical method of measuring the total light absorbed by these gases, vapours, and floating solids. I do not undervalue the work of others, but I think I have obtained a process promising good results with great simplicity, although I daresay it introduces its own class of difficulties.

1. The fundamental fact is that when iodide of potassium in solution is treated with nitric acid, so small in quantity as to cause no change of colour in dull diffused light, a change takes place when the same mixture is brought into clear light; iodine is set free and the solution becomes yellow.

2. The amount of iodine freed can be titrated with great exactness by the use of hyposulphite, as is well known.

In these two facts lies the whole process: the first is the new part, the second makes the first quantitative, and its use is of course part of the novelty.

3. It is known that strong acid liberates iodine. Weak acid does so after a long time, but the process is hastened by light.

4. Heat even to the boiling point does not act so well as light (experiments being made in sealed tubes to prevent loss of iodine, and with a considerable volume of air).

5. Heat assists the action of light.

6. A solution may be exposed day after day so as to give the accumulated effect of sunlight, in a measurable condition at the end of the time.

7. The solution of iodide of potassium as hitherto obtained is subject to change. An old solution—that is, one nearly a month old—was found more sensitive than a new one in all cases tried.

* Abstract of a paper read before the Royal Society.

8. The result of No. 7 is, that a certain allowance may require to be made for this, in those cases where the periods of observation with one solution are long.

9. The amount of allowance to be made for temperature is not made out. It is not certain that any is required in the cases when weak acid is used. The weather has not allowed any combined action of great light and heat, but with heat and light in the rays from an electric light with a parabolic reflector, the action was very rapid.

10. Specimens of experiments (prospective at first). It was found convenient to use a solution of 2 grms. of iodide of potassium, afterwards changed to 1 grm., in 100 of water, and to use half of this for an experiment, *i.e.*, 50 cub. contims. of the solution, which may be called A.

A nitric acid solution having an acidity equal to 1 per cent. of sulphuric anhydride was made; this may be called B. Only very small portions of B were added to A.

Examples in which the decomposition was measured by a solution of hyposulphite of sodium, which may be called solution C=0·1 grm. per litre of iodine (or as convenient). I shall extract experiments made with B solution 0·8 cub. centim., because it is an intermediate one (·2, ·4, ·8, 1·6, and 3·2 have hitherto been the favourites).

1880.		B sol.		Measure by C solution (hyposulphite.)
Mar. 3	Sunshine and cloud alternately ...	0·8. ...	After 2½ hours ...	8·1. First colour in 20′
,, 4	Sunshine	0·8. ...	—	First colour in 30′
,, 5	Dull all day	0·8. ...	,, 4 ,,	... 0 9.
,, 8	Sunshine	0·8. ...	,, 2½ ,,	... 7·5. colour in 20′
,, 9	A little sunshine... ...	0·8. ...	,, 2½ ,,	... 4 8.
,, 10	Foggy, with a gleam of sunshine ...	0·8. ...	,, 6 ,,	... 1·5.
,, 11	Bright	0 8. ...	,, 2½ ,,	... 7·2.
,, 12	Dull and wet	0·8. ...	,, 3 ,,	... 0·6.
,, 13	Dark and dull	0·8· ...	,, 2½ ,,	... Faint trace
,, 15	Changeable	0 8. ...	,, 2½ ,,	... 1·8.
,, 16	Changeable	0·8. ...	,, 2½ ,,	... 1·6.
,, 18	Sun through haze ..	0 8. ...	,, 2½ ,,	... 5·8.
,, 19	Bright	0·8. ...	,, 2½ ,,	...11·5.
,, 20	Fog till 11.30	0·8. ...	,, 2½ ,,	... 3·2.
April 1	Sun and showers ...	0·8. ...	,, 2½ ,,	... 1·6.

(*a*) 2½ hours' exposure to not very bright clouds; (*b*) in dark:—

(*a*) Temp. 12° C. in light. Sulphuric acid used same acidity.	C sol. required	(*b*) Temp. 20° C. in dark. Sulphuric acid	C sol. required.
0·4 ...	... 0·5 ...	... 0·4 ...	... 0
0·8 ...	... 3·9 ...	.. 0·8 ...	... 0
1·6 ...	... 4·9 ...	... 1·6 ...	... 0
3·2 ...	... 6·1 ...	... 3·2 ...	... 0

11. There seems, therefore, no reason to doubt that this is a true photometric process, with special capacities to be developed in time. I may add that I did not obtain better results at the window of my house than at the laboratory at the same time, the latter being nearer the centre of the town; thus the process has done the duty it was intended for, although only once tried for this special purpose. I am looking to it as an agent specially for the examination of climate, but of course it may have many uses. This process does not aim at delicacy, but at accumulation of effect. I have not spoken of a standard; the results are only comparative, but the process may be made to supply its own standard.

12. Since writing the above it appears that by using sulphuric acid some of the fears at first entertained may be avoided, as is shown by the following extract:—

B sol.		C sol. required after 2½ hours' exposure of A to light.		C sol. required after 50 hours' exposure of A to darkness.
0·2	... ...	7·6	... ...	0·3
0·5	... ...	15·1	... ...	0·6
1·0	... ...	23·4	... ...	0·6
2·0	... ...	30·4	... ...	0·7
4·0	... ...	43 6	... ...	0·7
6·0	... ...	53·8	... ...	1·3

The temperature of the solutions exposed to light =13°C., keep in darkness = 22°C. The iodine volatilised by heat was found so little that it might be neglected here.

The strength of solutions and the kind of acid to be used may vary. Similar results may be got by using bromide of potassium, but it is less delicate. The surface exposed and other questions require attention.—*Nature*.

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WORKING HOURS.

ALTHOUGH a discussion of some length has appeared in these columns relative to the pay and prospects of assistants, there is one important point, singularly enough, that has escaped the attention of our correspondents. There have been letters complaining of the low rate of pay, and others justifying the moderate wage that falls to the lot of most assistants, but not one word has been said upon the hours or length of time that assistants are required to work. This is a matter of grave consideration both to employer and employé, and sooner or later some definite rules on the subject must come into force. Even a moderate photographic establishment nowadays gives work to several hands of one class or another, and when a change is effected, there is usually an effort on both sides to make better terms. The master possibly thinks that the new assistant may well work a little longer than the last, and the assistant himself hopes to find an easier place than the former one. The consequence is that misunderstandings often arise at the outset, and neither principal nor assistant act fairly towards one another.

It would be impossible, of course, to regulate all studios by the same law, because of the wide differences between them in the nature of the business they transact; but there are certain general conditions upon which an understanding might exist in the case both of London and provincial studios. At what hour in the morning should employés report themselves at the studio? At what hour in winter or in summer should they be permitted to leave? The duties of first assistant are well defined, since they consist in taking the place of the principal in the studio when the latter is absent; but the work of other assistants and of ladies in the reception room are not, nor can they be, set fast. Usually it falls to the lot of the lady assistant who receives customers to take all cash and to keep the books, in which case her post is obviously very responsible, and one that should secure her the consideration of her employers. But, for all that, punctuality is very essential, as "A Lady" points out this week in our columns; and whether he be printer, mounter, retoucher, or even the lad engaged on odd jobs, it is of the utmost importance in a well-regulated studio that his time of attendance should be fixed and regular.

THE DEVELOPMENT OF UNDER- AND OVER-EXPOSED GELATINE PLATES.

DR. EDER'S important paper which we published last week on the subject of developing over- and under-exposed plates with the oxalate developer will be read with interest by all photographers, but especially by those who usually treat the gelatine film with this solution. Opinions are still divided as to the value of alkaline pyrogallic and ferrous oxalate for developing the gelatino-bromide film, but so long as it remains impossible to produce an image without that brown tinge inherent to pyrogallic acid development, the oxalate developer must perforce be made use of invariably in the production of positive pictures, at any rate. For this reason it may be said that while it is optional for the photographer to have the pyrogallic acid developer in his laboratory, the presence of the ferrous-oxalate therein is indispensable. Beyond its rapid action and the absence of ammonia fumes the circumstance that the oxalate developer yields a negative so similar in appearance and quality to one produced by the wet collodion process will always tell in its favour.

An objection has, however, long been lodged against oxalate development, to the effect that plates very much under-or over-exposed cannot be judiciously treated by its means. True, the addition of bromide exerts a retarding action in the case of oxalate development, as it does in that of the alkaline pyrogallic, but this addition does not satisfy all emergencies; for this reason Dr. Eder's researches are just now particularly welcome, and by following the method he prescribes the greatest control can be exercised in ferrous oxalate development. With very much under-exposed plates it is always difficult to cope, but by having recourse to what Dr. Eder terms a "strong reserve developer" a film that has received but a small fraction of its proper lighting may be converted into a good negative. This reserve developer, with a little care, may be kept for months, and any photographer of intelligence can prepare it. It may, in fact, be termed a rapid developer for gelatine plates, but for the present Dr. Eder only recommends its use for under-exposed plates.

It is not difficult of preparation. Into 100 cubic centimetres of water are put 50 to 60 grammes of neutral potassium oxalate, the dissolution of the salt being effected by heat. When dissolved, 17 to 20 grammes of ferrous sulphate, or what photographers usually call protosulphate of iron are added. The latter, if well stirred, will dissolve very quickly under the continued action of heat, and on complete dissolution the resulting red liquid is poured into a well-stoppered flask, where it remains for twenty-four hours. A good deal of potassium sulphate will crystallize out during the time, but none of the active oxalate. A developer prepared in this manner contains not less than twelve or thirteen per cent. of effective ferrous oxalate, and is consequently very energetic in its action, since the ordinary mixed oxalate developer only contains half this amount. After filtering, the reserve developer is poured into small well-stoppered bottles, which must be filled to the top, and will thus remain fit to use for months.

It is employed only when a plate has been treated with the ordinary oxalate developer, and this has failed to bring out an image. The ordinary developer is thrown away, and the reserve developer poured over the film instead. Any signs of fogging that may appear are counteracted by the use of bromide as in ordinary development. The treatment is therefore of the simplest, and consists only in the employment of a strong instead of a moderate developer.

In the case of over-exposed films, although the addition of bromide does permit one to control to a certain degree, Dr. Eder recommends a method of manipulation which does not involve the use of the full amount of iron at first. Supposing you have the saturated solutions (saturated, of course, cold) of potassium oxalate and ferrous sulphate at hand, you measure off as usual three volumes of the first and one of the second, but you do not mix them. You add, at first, but a few drops of the iron solution to the three volumes of potassium oxalate, and commence the development with this, and without the addition of any potassium bromide. If the image does not appear, then you add still more of your iron, until the whole amount measured off has been expended. As you add your iron, and perhaps also a little potassium bromide solution, you will find the vigour of your image increase. Many plates, says Dr. Eder, of the less sensitive description require no potassium bromide, as it causes them to become too hard; but with sensitive plates more or less bromide must be used to make them sufficiently clear and vigorous. Plates that have received twently times their proper exposure may be thus successfully treated by the oxalate developer.

Notes.

Mr. Swan holds in his hand, apparently, the solution of the problem of lighting our rooms with electricity. Last week, at Newcastle, we passed several hours in a drawing-room delightfully lit up by a tiny lamp of Mr. Swan's. He has succeeded in preparing a carbon thread, or wire, and a loop of this material, maintained incandescent by the electric current in a vacuum tube, supplies an exquisitely soft and steady light.

Mr. H. P. Robinson writes in an enthusiastic manner upon the subject of gelatine plates for landscape work. "I had half an hour on Rusthall Common with 16 by 13 plates a few days ago. The results convince me that the dry process is better than the wet for landscapes. A flock of sheep is just wonderful! You can see their eyelashes."

Large direct portraits will once more come to the fore with our rapid gelatine plates. What would the late Mr. Crawshay have said, had he heard that an eight-inch face could be secured in the studio with an exposure of a few seconds?

Tourists who travel with sensitive plates, take warning by this. "I had great difficulty in getting my plates through the German Custom-house; the fellows wanted to look inside the packets, and I could not make them understand that the films would be spoilt if once they saw daylight. Unfortunately, too, the paper was sealed, and that made them all the more suspicious. I won't have any sealing-wax in future. Luckily, the chief was a very good fellow, and when sent for he only laughed and said, 'Ah, ah! photographique!' and he passed me." So writes a correspondent on his way to Dresden.

In Mr. Mendelssohn's studio at Newcastle-upon-Tyne, the other day, we saw a very useful and practical accessory. It was simply the trunk of a slender tree placed upright, againt which the model, lady or gentleman, could lean. A simple and graceful pose is thus easily secured, combined with the utmost steadiness. Mr. Mendelssohn has produced some charming pictures of ladies by employing this simple accessory, and exercising into the bargain the art knowledge he knows so well how to apply.

In his studio, we may mention, there was not a square inch of bare glass. Although Mr. Mendelsohn permits at times a flood of light to sweep over the model, the illumination appears always soft and subdued. He has few curtains, but covers the whole surface of his glass with tissue paper. This he prefers to the employment of ground glass, which is apt to get yellow and dirty in towns or cities, and then disputes the passage of the light. A lad in an hour, says Mr. Mendelssohn, will cover the studio windows with tissue paper applied with starch, and it does not take much longer to wash down the old material.

We recently described the way in which photography at the Kew Observatory is made to record the movements of the mercury column, and thus write down the meteorological changes of the earth. Our readers may remember that the same principle is employed in reading the human pulse. A flexible bag containing mercury is put near the region of the heart, the mercury rising from the bag into a glass tube. Every beat of the heart consequently moves the mercury column. A sensitive plate is kept moving along behind the head of the column, and the rising and falling of the mercury makes a wave-line upon the sensitive plate. If the action of the heart is very fast, the zigzag marks are very frequent; and if the action is energetic, the zigzags are very high. An accurate judgment of the patient's state of health may thus be secured by photography.

We have seen a series of these pulse photographs executed by a clever French doctor. They were pictures secured at all ages. In the child the wave lines or zigzags are sharp and rapid; in the case of manhood the zigzags are fewer and more vigorous; and in old age the marks are zigzags no longer, but rounded curves. In the case of a man of ninety, whose pulse was written down by photography in this manner, the result was nothing but a softly undulating line, painfully indicative of the passing away of energy and life.

It will be remembered that it was by means of a pulse photograph that Dr. Ozanam clearly demonstratad dicrohism, or double action of the heart, a phenomenon about the existence of which there had been considerable doubt. Instead of the mercury column making one leap at every pulsation, he found that it made a double or even treble leap in order to reach its maximum height at each beat of the heart.

A Roman photographer, M. H. Le Lieure, has hit upon a happy idea. With some care he has collected a series of historic costumes of the past centuries, invoking the aid of artist and antiquarian in securing correctness of design where the original vestments failed him. Models well-chosen, and duly clothed and accoutred, were then photographed; the result is a fine series of pictures of the olden time, which perhaps convey a better idea of the appearance of our forefathers than could be secured in any other way.

The choice of models in this case reminds us of the plan adopted by the well-known firm of Braun, of Dornach, in securing their series of Swiss national costumes. They might, of course, have sent round a photographer to select a model in each canton, attired in her peculiar garb. But they conceived a better plan than that. A costume was ordered, correct in all its details, from the different capitals, and suitable for young women already at Dornach who were not only comely in person, but trained as models. The result is a most pleasing series of costume portraits, over which many an artist has marvelled.

Topics of the Day.

DUTIES OF A LADY IN THE RECEPTION ROOM.

BY A LADY.

The subject on which I have been requested to write is one requiring far greater space than can possibly be devoted to it in these columns, and demands more attentive consideration than it generally receives. The position of assistant in the reception room of a photographer is one of grave importance and responsibility, on which much of the success of the business depends; it is usually filled by one of our sex, and I think, for several reasons, rightly so. Many and varied are the requisites necessary to fit the candidate for a proper fulfilment of the office. She should possess an aptitude for business, be a good penwoman, and have a fair knowledge of accounts; active in habit, of ready tact, no small control of temper, untiring in listening to the sometimes fussy desires of customers, and ever evincing a readiness to meet and carry out all their wishes. She should be neat in appearance, courteous and cheerful in manner—in one word, she should be *a lady*. And when one is found combining all the qualifications, she should be prized as she deserves. In enumerating the requirements expected for the effectual filling of such a position, I purposely leave out of consideration very large firms, where, from the numerous employés, these duties would be more distributed, and confine myself to those of a smaller field, which not unfrequently embraces a really higher class business.

In order to convey a more practical and realistic idea of what the duties are, I fancy it would be as well to go through the routine of a day's work. I would say, then, ladies—for it is to you I am more immediately addressing these remarks—the hour of business commences at nine o'clock; and here let me place at "the very head and front" of the day's proceedings the word punctuality; it is not a very difficult matter to understand, yet it is one of the most vital importance, on which your employer's interest, as well as your own comfort, depends. There is yet one other requirement of similar value and consideration, viz., method. A due observance of these two simple words will have a wonderful effect in lightening labours that might otherwise present considerable difficulty. With this little advice, offered in all sincerity, firmly fixed in your mind, it is astonishing how smoothly things will work. At the hour appointed, therefore, be ready to enter your room—get out specimens, dust and arrange them, "have a quick eye to see" if they betray signs that tell too plainly a change would be beneficial; this done, look through the prints that will have come from the printers, to ascertain if any, through carelessness or inattention (which is much the same) need reprinting; if this be the case, make out a list with the necessary instructions marked on the spoilt duplicates themselves, to be given to the printer; these being before him will be more impressive, and he will see beyond misunderstanding what is to be corrected in the subsequent copies.

You will by this time in all probability receive from the head of the house the letters requiring notice, either containing orders or needing information. Attention to these may well be left until later on, when valuable daylight is beginning to wane. What you do now is to get the mounted prints and make yourself ready for touching out. Some may object to this being carried on in the reception room as out of place, but I think it looks well to see such signs of active employment, and so long as the photographs are kept together, and not suffered to lie scattered higgledy-piggledy over the table, to be handled and disarranged by the inquisitive. it affords occupation when you are not attending to customers, and forwards business. The best mixture of colours for the purpose I have found to be Indian ink, madder brown, and Prussian blue, in such proportions as may be necessary; with these three any photographic tints can be matched. Use the point of your brush, not the side; the dryer your colour is worked the better, adding just sufficient gum to impart the amount of gloss the print itself possesses. As opportunity occurs answer the letters given you, see that your cash taken during the day—which in all cases ought to be entered at the time of its receipt, whatever else halts—is correct, and such of the books as are confided to your care made up. After this you can devote yourself to mounting.

Many use a thin glue for this purpose; I prefer starch, as being more manageable, cleaner, and readily made. It should be prepared fresh for every batch of pictures, and, if made in the ordinary way, as much as may be required mixed gradually with a little cold water until it is of the consistence of thick cream, when boiling water is to be added until it thickens and becomes transparent. (N.B.—See that the water really boils.) Have handy a small cup or gallipot filled with cold water, and a clean towel to cleanse the tips of the figures after each print is mounted; this will save some at least from being spoilt.

When customers enter, be very particular about taking names and addresses as soon as these are mentioned; make a note of them at once, and this will then save you the trouble of asking for the information. This is exceedingly important; you never then make a mistake, and you do not call upon your customers to repeat the information, a circumstance that is often distasteful to them.

This is the brief sketch of an ordinary day's work in any first-class house. Of course each person will, after holding an engagement a very short while, be enabled to judge of the best way of apportioning certain duties for certain days; a method of this kind is much better than leaving things to be done haphazard.

In conclusion, I would say make up your mind, in entering on such duties, to so perform them that you make yourself necessary to your employer, and by using all your endeavour to forward his interest you will most effectually further your own.

The Topic for next week will be "Examination and Selection of Gelatine for Photo-Mechanical Printing," by Dr. Adolph Ott.

A PHOTOGRAPHER'S HOLIDAY.

BY GEORGE BRADFORDE.

It is two years since I had my last holiday, so bear with my rapture over this one. The time of green leaves, green meadows, and blue skies has once more come round; the time when the city-bound worker pants for freedom, the time when my brother photographers make ready their knapsacks and tripods, and peregrinate over the country in quest of the picturesque. Glorious summer—bright fruitful earth—I hail thee! Like a second Tell, I feel that I am free! My foot is firmer—my spirits rise with the lark that warbles so sweetly overhead—my ears catch the mellow echo of the cuckoo in the shady grove yonder—my eyes pierce the warm mist that floats on the crest of the craggy hills—my breast expands, and—I feel that I am free! I actually feel young—as if ten years at least were lifted off my shoulders since I breathed this health-giving air. Now that my raphsody is over, I shall come down a step and be practical—practical as far as giving a graphic description of one of the most romantic spots in England is concerned. If any of my photographic friends are on the point of taking a holiday, and have not already decided, let me give the casting vote, and let them come to Cheddar! Here you will find scenery to suit all fancies: woods, gleus, lanes, mountains, lakes, caves, water-falls, and Heaven knows what all beside. Allow me

to be your cicerone for one day's ramble. The whistle is blown, the train stops, and the porter shouts Che-ddar! Outside the station Ge-arge waits expectantly with his waggon, looks so beseechingly—so ill-used, in fact—that it would be a pity not to indulge in fourpenn'orth: for that small sum he will drive you all through the straggling village, right up to the entrance of the pass that divides the towering cliffs. To the left you observe the Cliff Hotel, and, hat in hand, here is "mine host," come forth to bid us a hearty welcome. Please observe "mine host"; he is no common country inn-keeper, he is affable, polite, very polite (indeed I once heard a timid gentleman with a stutter observe that his "po-po-politeness w-was tru-truly ter-terrifying!") but he has no base servile manner with him, he is polite, not cringing, and—and his bottled stout is excellent.

Now, having refreshed ourselves, we will go and have a look at "mine host's" gardens. Within two steps of the back entrance we are chained to the spot in admiration; to the left plays a sparkling fountain—before us rises a mass of rich foliage—to the right flashes, dashes, and roars a waterfall, the whole backed in with huge towering cliffs. Let the amateur, the holiday-maker, or my brother pro.'s, spread their tripods here, and let it be the *first thing* in the morning; the shadowed light on the rushing water, the piercing sunlight on the overhanging foliage, the gray cliffs glistening above, all blend together so sweetly that without a doubt he must be a very poor hand that cannot make a picture of such a scene. If the amateur likes, he can find enough to do in "mine host's" grounds during his holiday, there being all manner of quiet spots and grottoes scattered over the place.

To the more ambitious brethren, I would now advise a move along the road, first paying a visit to friend Cox's stalactite cavern. By the way, Mr. C.'s cave has never been photographed, and as he has kindly granted me permission to do so, I shall perhaps at a future date give my experience upon it. It is lighted by gas, and I mean to try dry plates, so I expect I shall have something of interest to tell you.

We now pass along the road, and presently come in full view of the famed Lion Rock. At a certain angle of the road you can get Rose Cottage right underneath; at this point you will get a charming view. Move a little further up the road and turn your camera round towards your first point of starting, and then you have as beautiful a bit of water and woodland as it has ever been in my power to photograph.

Move further along the road, and if your taste lies in towering crags covered with brambles, golden gorse, and brackens, you may revel here to your heart's content. There is nothing in Scotland can equal the grandeur of these cliffs. I have roamed round dark Lochnagar; I have trod the sterile wastes of Glencoe and Glenshee; I have seen the thunder-cloud burst over the smoking peak of Heckla, but never have I witnessed anything to equal in terrific grandeur a storm on the Mendips! Possibly it may be that Cheddar cliffs being so close together, when the lightning comes it gives it that Gustave Doré effect that I have never seen elsewhere. I am going to be down here for some time yet, and if I can catch a proper storm I will send it to you. I have done all the stationary bits about, and I should so like to catch one of the flying.

I will now leave you and let you pick out your own scenery, promising to meet you at the Cavern where Ge-arge, with his beseeching look, awaits to drive us to the station.

With a dozen dry plates and a convenient dark box, an amateur or a brother pro. would find Cheddar one of the most delightful spots to smoke away a few days and gain time to straighten up his back for the sterner realities of life. I only hope you will enjoy your holiday as much as I am doing mine.

FRENCH CORRESPONDENCE.

Process for the Transfer of Negatives—Praxinoscope of M. Reynaud—Different Methods of Flowing Gelatine over Glass—Photographs of Interiors by M. Laurent, of Madrid—Employment and Solubility of Salycilic Acid.

Process for the Transfer of Negatives.—M. Arentz described, at the last meeting of the Photographic Society of France, an ingenious process for transferring negatives which he had for some time worked in the studio of M. Dujardin. There are many processes of this kind already in existence, but this one by M. Arentz can be recommended as being both simple and expeditious. In order that my readers may have an opportunity of trying this process, and of satisfying themselves of its superiority to others of the same kind, I give a short account of it. Let me premise by saying that the whole operation of removing the pellicle of collodion from the glass plate and transferring it to some other support need not occupy a longer time than a quarter of an hour. In the first place, a solution of three grammes of manufactured caoutchouc in one hundred of benzine is made and carefully filtered; next, raw collodion must be prepared of the same density as that used for taking the negative. The plate, having been retouched when necessary, but not varnished, is then coated with the caoutchouc varnish, after the same fashion as it would be originally coated with collodion, and is placed to drain and dry for a few minutes. Afterwards, when the benzine has sufficiently evaporated, it is collodionised over the caoutchouc varnish with the raw collodion, and again left for a little while to dry; the film is then cut with a penknife all round the edge of the glass to the size required. Two pieces of any kind of paper are next taken of the same shape as the plate, but of slightly larger dimensions than those of the pellicle when removed from the plate, and one of these pieces is plunged into a basin of water; it is placed, still wet, on the film. With a roller, formed of a cylinder of wood inserted in a piece of india-rubber tubing, the damp paper is made to adhere to the film; when now a corner of the paper is turned back, and the corresponding corner of the film carefully raised with the blade of a penknife, and turned over it, the whole paper, by a slow but continuous motion, may be pulled off the glass, bringing the collodion pellicle with it. We have thus the negative removed from its original support, and stretched on the surface of a sheet of paper, to which it adheres by reason of the humidity of the latter. In this state it could be left to dry, and could then be used in its pellicular condition, but if it be desired to simply invert the negative while keeping it attached to the glass, the second sheet of paper above mentioned must be taken and wetted in the same way as before. The first sheet, with the pellicle attached, is then placed on a glass plate, the pellicle being upwards, the second sheet laid over it, and the superfluous moisture pressed out with a roller. By the same manipulation as in the former case the second sheet of paper may be stripped off, bringing with it the negative in its original position. A glass plate is then coated with a solution of gum-arabic in water, the negative on its paper support is placed over it, and pressed on to it with the roller; the paper is again removed, and the pellicle remains adhering to the glass, but the negative is in a reversed position. It is better to do without the varnish, because, as as it shrinks in drying, it causes the negative to wrinkle; besides, the surface of the plate is quite hard enough without the varnish to resist any rubbing. The reversed negative is not quite so large as the original plate; it shrinks about the millimetre in every thirty-two centimetres of length. M. Arentz states that by this method he can also transfer films of gelatino-bromide, a fact of great interest now that the gelatine plates are coming more and more into use. I have myself seen the whole process very successfully carried out, and as a means of reversing negatives is often required, I have had no hesitation in describing all its details.

The Praxinoscope of M. Reynaud.—This is a mechanical toy on the same principle as the phenakistiscope, the zootrope, the hioscope, &c., wherein the rapid movements of a series of pictures represent the different phases of some living action on the retina and the illusion of actual movement. M. Reynaud has improved his instrument so as to be able to project the images on a screen, thus making the motion visible to a large number of persons at once. All the objects in their different positions are, however, drawn by hand, and there seems to be room here for the application of photography. Mr. Bridge has succeeded in taking fourteen different and successive views of the phases of action of an acrobat in executing a somersault. Why cannot such a series be applied to the praxinoscope? In the same way the successive action of any other object in motion could be reproduced by photography, and the realisation of the idea would be a new means of developing photographic industry.

Different Methods of Flowing Gelatine on Glass.—Small beginnings often give rise to big results. M. Andra recently pointed out a method of causing gelatine to flow readily over glass by first coating the latter with a solution of sugar in water, and then sponging it off and rubbing the glass quite dry with a linen cloth. M. Laurent, of Madrid, has now repeated this experiment, and has found that by submitting the plate coated with sugar to the steam of boiling water, the gelatine will then flow perfectly. Silicate of potash poured over the surface of the plate has also been recommended for this purpose, and Mr. Henderson some time ago suggested silicate of soda. It remains to be seen whether with these later methods it is as easy to reverse the negative as in that where simply sugar is used.

Photographs of Interiors.—Apropos of these experiments of M. Laurent, the same gentleman has, by means of M. Stebbing's pellicle, produced some views of the interior of Seville Cathedral and of other churches, such as have never been previously equalled in photography. These prints, which I have myself had an opportunity of inspecting, are 30 by 40 centimetres, and are as perfect as can be wished for. Here is an answer to those who assert that we have attained quite sufficient rapidity in photography. Reproductions such as these prove that we cannot attach too much importance to the ability to reduce the length of exposure. There are plenty of means of decreasing the rapidity when we have attained it, but when it is wanted it is impossible to secure it.

Employment and Solubility of Salycilic Acid.—The property which salycilic acid possesses of preventing decay in organic substances is not sufficiently taken advantage of. A few drops of this acid added to a solution of gelatine in water makes it keep admirably. I have kept such a solution for from eight to ten months without observing the least sign of putrefaction. Care only must be taken not to employ the acid in cases where the gelatine has to come into contact with ferric chloride, as it produces a violet tinge which would be, as a rule, ruinous to the effect which it is intended to obtain. Perchloride of iron can be used as a test of the presence of salycilic acid in any substance, to which it has been added as an antiseptic, by means of the violet tint which has just been mentioned. If the acid be introduced into an emulsion of gelatino-bromide, though it will not affect the sensitiveness or quality of the emulsion, it will be immediately detected by the light red colour produced in the film at the moment of development with oxalate of iron. Its use must, therefore, be avoided when the organic substance, towards which it acts as an antiseptic, is to be treated with a salt of iron. Sulphate of iron itself produces a purple colouration. Salycilic acid is sparingly soluble in water, but much more soluble in alcohol. I give here some information on this point which it may be found of service to note:—

1 litre of water dissolves at		0° C.	1·50	grammes of the acid.
,,	,,	15°	2·25	,,
,,	,,	30°	3·90	,,
,,	,,	55°	9·80	,,
,,	,,	90°	51·80	,,
,,	,,	100°	79·25	,,

Cold alcohol will dissolve a quarter of its own weight of acid. Hot glycerine dissolves 12·5 grammes of salycilic acid per litre. According to the above table of solubility of the substance of which I am writing, it appears that a litre of water at the normal mean temperature of 15° C. dissolves 2·5 grammes of acid, and this shows that a solution of an organic body can be quite saturated without introducing any large quantity of this energetic antiseptic. LEON VIDAL.

Correspondence.

THE PAYMENT OF ASSISTANTS.

SIR,—In the discussion relative to the above subject at present appearing in the PHOTOGRAPHIC NEWS, I think "An Operator of Six Years' Standing" is being somewhat harshly dealt with at the hands of some of the correspondents for his temerity in requesting advice. He asks for beef, and they give him mustard. Doubtless he is only dabbling in one of the many narrow streams tributary to the great river of photography, unfathomed yet, at least in its mid-channel of chemistry, by even our master minds of science; but he acknowledges his lack of skill, and a fault confessed is half atoned for.

"H. B.," writing on the subject, declares that from experience he can vouch that from £2 to £3 is the sum paid weekly to competent assistants; but—

> "Moves our free course by such fixed cause
> As gives the poor mechanic laws?"

Indeed, no; the merit of a photographic assistant, like water, must find its level; with of course the usual exception to the rule, the only limit to an employé's pay is his worth to his employer, unless they are as a lot underpaid, and I think that this supposition is sufficiently repudiated by the salaries already enumerated in the NEWS.

There are many persons as well as artists who *paint* "pictures," and so there are photographers and photographers. I consider that one man has about the same chance of practically working photography successfully, as a builder has of erecting a house, undertaking the duties of masons, joiners, painters, and all their satellites, by himself. The attempt is often made in our business, certainly; but how different the results from those that characterise the work of our leading studios, where each man is adapted to and employed only in a particular duty!

Negative operating, which, in the true sense of the word, means scientific art, exacts three essentials from its devotee before it will become really subservient to him: these are: natural capacity, perseverance, and opportunity.

I would advise "An Operator of Six Years' Standing," or, indeed, any other photographic student, to first gain a good general knowledge of the business, and meanwhile endeavour to form an unbiassed opinion as to which particular branch his capabilities are most suited to, then "nail his colours to that mast;" bestow all his attention to it, at once if possible—if not, make it his goal that he must ultimately reach, remembering that general assistants are simply, figuratively speaking, "jacks of all trades," and make the large class who receive only from 20s. to 40s. weekly.

And independent of technical skill, there is one other primary point which is only too often neglected. "Men cannot be all born geniuses," says John Bright, "but there is one thing within the power of you all which raises you to the level of a hero—that is, to do your duty." I should recommend employés to take these words to heart; pause over them. They should remember that they can

only be true to themselves by being faithful to their masters—that their interests are identical. It is not well that they leave their work with a sigh of relief just as the hour is striking that gives them liberty.

Assistants are not true to themselves who begin blustering immediately a little pressure of business necessitates some trifling extra attention. Nor are they who consider the absence of their principal the signal for recreation; nor yet again those who become prematurely impressed with the idea that they are the great *I am* indispensable. Each of this kind of men is classed by employers as necessary evils to be disposed of as soon as their convenience permits. It is strange how few vacancies occur in the principal houses, where the largest salaries are paid, too, and yet the employers must reasonably expect adequate remuneration for their outlay.—Faithfully yours, Focus Junior.

PRINTING AND TONING.

Dear Sir,—In reply to "Troubled Printer" (in your issue of the 28th May), I should suggest his boiling the sensitizing solution in a slightly alkaline condition. Stand till cold, and filter the deposit of accumulated organic matter precipitated by boiling. Test for strength, &c.; use fresh toning solutions every day, for there is not much to be saved in using old, worn, toning solutions; shou'd they be used over and over again they soon absorb impurities that will inevitably cause all kinds of stains and markings, the liquid being filled with impurities from the continued floating of albumen. Use hyposulphite neutral.—Faithfully yours, C. J. Hopkins.

CANARY MEDIUM *v.* RUBY GLASS.

Dear Sir,—The discussion of this subject might now be left without another word from us, seeing that the advocates of "canary medium," have not made out their case, nor have they been able to controvert the facts which we gave as the result of three simple tests applied to the "medium." But we must ask your indulgence once more to explain the latest proofs we have obtained of the fallacy of Mr. Bridge's idea, by a series of tests made upon a piece of the "real medium," sent to us by Mr. Bridges himself, and which, we may add, is precisely identical with that we originally used, with a request that we should test it side by side with the ruby light, and report thereon.

We have applied the three tests to Mr. Bridge's paper which had been previously applied to our own, viz., the spectroscope, development, and exposure of a plate, and with the same results as before, though in the development test veiling was apparent in a less marked degree. We then applied a fourth test thus:—An extra sensitive plate was placed in a printing frame, one half being covered with Mr. Bridge's paper, the other half with a piece of ruby-orange glass, such as we regularly use; it was then exposed for one minute to daylight (in the shade), and developed in the usual manner with alkaline pyrogallic; the result is shown upon the enclosed strip of glass, cut from that plate. You will see that the portion under "canary medium" gives an impression quite equal to the half tones in a well-exposed negative, whilst the portion under ruby orange light is perfectly clear glass. Surely this is conclusive evidence against it, adding force to the correctness of our first opinion, that an ordinary or slow bromo-gelatine plate can be properly developed under the light of the "medium," but an extra sensitive plate cannot. We adhere to this opinion, and enter our verdict against the "canary" as a *safe* "medium," though pleasant it may be.

And now, in taking leave of the subject, a suggestion occurs to us: is it possible that the natural daylight in Leeds and Bradford is of a less actinic character than that in Southport? If not, we cannot understand why "canary" under similar conditions should behave better in Yorkshire than it does in Lancashire.—We are, &c.,

D. H. Cussons and Co.

THE GELATINO-BROMIDE PROCESS.

Sir,—Captain Abney said in his communication to the Society of Arts, on some recent advances in photography, that he did not wish to enter into any controversy as to whether Dr. Maddox or Mr. Burgess should have the credit of first bringing this process (the gelatino-bromide) into notice. I am not aware of any controversy on this subject, and cannot imagine how there can be any. I have not been forward to publish my part in this matter, but as I am often called upon to explain my connection with this process, I desire to say, once for all, that I do not claim to be the first who tried to use gelatine as a substitute for collodion. Dr. Maddox and a great many more attempted something in this way, but what they did was no more like what I did, than failure is like success. I claim to have introduced the first workable gelatine process, and that is so very much like the last, that I cannot distinguish the difference. The emulsion which I first sent out without publishing any formula opened men's eyes at once to a new idea.

An emulsion with all the salts formed by mutual decomposition eliminated was a novelty. At one stroke a host of troubles was knocked on the head. A washed emulsion, my pet process, did away with all the endless messing with organifiers, &c., &c. My method of washing the emulsion is the one now universally used; it was introduced to the public as Wratten and Wainwright's improvement, but it was got indirectly from me, and I appeal to Mr. Mawdsley to say whether I did not communicate that plan to him years before Wratten and Wainwright were heard of. The pellicle also was my invention. I told Mr. Kennett that the best way to keep the emulsion was to dry it up, and I actually showed him a quantity of partially desiccated emulsion. The clever man straightway took out a patent. I hope he has benefitted by it, for I have not. Yet I hope the day will come when photographers will recognise me as one of the fraternity who has done something to lighten their labours.—I am, sir, yours truly,

J. Burgess.

DEVELOPING IN DAYLIGHT.

Sir,—I would advise those photographers who object to ruby glass, "canary medium," and dark rooms generally, to try developing gelatine plates in ebonite trays tolerably well filled with pyrogallic developer, stained with cochineal colouring or Judson's dye (cardinal); an ordinary gaslight, or even weak daylight, may then be used.—I am, &c.,

T. G. Whaite.

ASSISTANTS.

Dear Sir,—Some one has done me the honour to pick up my last topic apparently in a wrong sense. I beg to inform "X." (it puts me so much in mind of "Bill Stumps—His mark," that I cannot keep from laughing) that I did not allude to bad masters, or bad men, as he will find by referring to the paper alluded too. And I likewise take umbrage at "X." for using such an expression as "tries to caricature." Caricature means, according to the dictionary, a ludicrous representation. Now, I was never more in earnest in my life than when I penned that article. I used no fine weapon, no satire, no double-edged sword to attain my end—I took a thorough Briton's cudgel in my hand; if I wielded it clumsily, I wielded it with a will and with strength, and I hope I shall long be able to wield it in the same cause. The cause is justice—and the name of the cudgel is truth! The last lines of my Topic are, that I could go on for ever so long in the same strain. So I could. I could have related experiences that would astonish every reader you have. But I do not see what good it would do. I wrote the Topic at your desire, and I thought it would do good, as I took for example "a good master and a good man." I did not allude to "X." and his employées. I do not want to offend him, but I would beg respectfully to remind him that there

is an old Scotch saying that "Bad masters are aye ill served."—I am, yours respectfully, GEORGE BRADFORDE.

Parkfield House, Cheddar.

I WON'T.

SIR,—Just now, when no stick is allowed naughty boys, some way or other they must be brought to see the evil of their ways. Mamas should show to rebellious Master Freddy "I Won't." Surely to "Look on That" would be operative! We rather think "I Won't" equals "Ginx's Baby": at any rate, it is being published, and here it is.—Yours truly, MARION AND CO.

[Messrs. Marion and Co. forward a copy of this picture for us to "look on," a photograph from life by Davis and Son, of Lancaster, of certainly a very naughty boy, who, in his, tantrums, shows every tooth in his head, amounting to two. But why send to us?—what have we done to deserve the rebuke?—ED. P.N.]

Talk in the Studio.

SHEFFIELD PHOTOGRAPHIC SOCIETY AND HADDON HALL.—On Wednesday the members of the Sheffield Photographic Society held their second excursion for the season to Haddon Hall. The morning was fine and the air fresh. The drive on a drag and four, by way of Chatsworth and Rowsley, put the whole party in good spirits. On reaching Haddon, however, shortly after eleven o'clock, an unexpected difficulty presented itself. The cameras were refused admission within the Hall, and the conductors of the party were informed that no photographs could be taken without a written order obtained at Mr. Nesfield's office near Bakewell. Two members accordingly proceeded to Bakewell, and found it necessary to remove from the mind of the gentleman in charge of Mr. Nesfield's office an impression that they were seeking to obtain admission "under false pretences." The names of the owners of cameras were taken down, and after a conversation extending over five-and-twenty minutes, a restricted consent was given to those persons, but no others, to take photographs within the two court yards, the garden, and the terrace. Much stress was laid upon the fact that no smoking was allowed within the building, and when the photographers at length got their instruments to work, it was with a smile that they observed a young man who seemed to be in charge of the place smoking a short pipe near the ancient Roman altar, which yet retains so much of its sacred character that no profane photographer is permitted to point his camera at it. A heavy shower somewhat hindered operations during the afternoon, but when the rain was over some excellent negatives was obtained. The party partook of tea at the "Royal Oak," Bakewell, and, after the viands had been disposed of, a vote of thanks was passed to the two members who had proceeded to Bakewell and procured the permission to photograph. The Society has been to Haddon before, but never until Wednesday was any objection raised to the practice of this interesting and elegant art.

ACTION FOR SLANDER.—In the Bail Court, at Westminster, Mr. Justice Bowen and a common jury tried the case of Mavis *v.* Thorniley, which was an action brought by a photographer in the Old Kent Road against a surgeon and apothecary in the same road for slander. The defamatory words alleged in the statement of claim were, "All your money is bad. I will lock you up for passing bad money." The plaintiff said that on the evening of the 14th December, 1879, he was in the defendant's shop, and bought some pills of the defendant, who applied four silver coins, tendered in payment, to a coin-tester, and pronounced them bad, and when the plaintiff refused to give him back his pills, said, "Then I shall lock you up for passing bad money." The defence was that no such words were uttered; that nothing was said about bad money, and that all the defendant said was that he did not like the coins tendered by the plaintiff, and would not take any of them in payment for the pills. It was admitted that a policeman was sent for, according to the plaintiff's account, for the purpose of taking him into custody, while according to the defendant, it was at the plaintiff's instance and for the purpose of deciding that the coins were good. The defendant declining to apologise or admit that he had made a mistake, this action was brought, and in the result the jury found for the plaintiff, with damages £5. The learned judge gave judgment for the plaintiff accordingly, and declined to deprive him of his costs or to stay execution. Mr. Candy appeared for the plaintiff; Mr. McIntyre, Q.C., and Mr. J. J. Cooper Wyld for the defendant.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. PIPER AND CARTER, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. PIPER AND CARTER, *and crossed "Union Bank, Photographic News Account."*

JOHN BARTON.—The camera stand consists of six bamboo sticks, about four feet nine inches long, with fishing-rod joints for portability. These are hinged in pairs, with jointed ferules and spikes to stand on the ground: the tops have holes to fix them to a wooden top, which Mr. England prefers for lightness, and which is about eight inches in diameter. The address of the maker is, Mr. Collins, 56, Cochrane Terrace, St. John's Wood.

R. H.—You will doubtless have received by this time the apparatus you were enquiring for; it was to have been forwarded last Monday. The little print you send is certainly good.

SIDNEY SMITH.—Nothing can be better than thick flannel or blanket. In a drying closet with a current of air; Mr. Swan employs a temperature of from 70 to 80 degrees Fah.

W. W.—Moisten with a few drops of hydrochloric acid: that will tell you at once.

A BEGINNER.—You must specify the nature of your lens, before we can tell if it can be made to answer your purpose; is it of English or foreign manufacture? See our advertising columns; possibly you could hire from some of the dealers in second-hand apparatus.

A. B. F.—"Hardly ever."

FOCUS.—By unscrewing the posterior cell a little, say half a turn or a turn, you will at once modify the focus.

BIPOD.—Very clever; only we wish you had kept the original, and sent us the picture.

CARL NORMAN.—We have been able satisfactorily to solve your problem. The question of the lenses being at fault must be dismissed at once. Each of your negatives shows a *negative* and *positive* representation of the windows. By placing the plates face to face we found that the weaker impressions of the windows on one film coincided *exactly* with the stronger impressions on the other. In fact, the weaker impressions on the one plate are prints from the other. The amount of light stored up in that portion of the film impressed by the windows has sufficed to produce a "set-off" on the other plate, which must at some time or other have been in contact. Your negatives are very fine illustrations of one of the most interesting of photographic phenomena.

W. H. P.—1. Send us the exact formula of your bath; printing baths frequently become brown in use, but this does not usually influence the prints. 2. You are right in your assumption, but the question is how much hyposulphite is required to fix perfectly. One authority, Dr. Gayer, maintains that one ounce of hyposulphite dissolved in 8 ounces of water is required for the fixation of a single print eight inches square; this amount is, of course, extraordinarily high, but it shows you that opinions vary. To have the solution fresh and strong is, however, the dictum of every photographer.

N. JACKSON.—Any London photographic dealer will get it for you.

G. E.—You cannot do better than obtain a copy of Capt. Abney's "Gelatino-Bromide Processes" (Piper and Carter), to be published in a few days.

J. JORDAN.—But then they never use leather collodion (or collodion containing castor oil) for plates to be dipped into the dipping bath; there is very little doubt that the latter would be injured if you were to do so. The material is employed only as a varnish or for other mechanical purposes.

J. T.—The blue line drawings are produced by the Pellet process; you may purchase the paper ready coated if you like. Perchloride of iron is put upon ordinary sized paper, and this is then placed in a printing frame under a drawing or plan the lines of which are sketched with Indian ink, or other opaque pigment. The perchloride is reduced by the action of light except where protected by the lines of the drawing; the sheet, taken from the printing-frame, is now put into a strong solution of ferrocyanide of potassium, which acts upon any perchloride remaining (that under the lines of the drawing), and producing Prussian blue lines. The print is washed, dipped in hydrochloric acid, and finally washed again.

RESIDUE.—You may precipitate your silver as you propose with a copper-plate; you thereby get pure silver, and not chloride. Collect the precipitate, and dissolve in nitric acid.

L. L.—Ameisen Saure is simply formic acid; it was formerly extracted from ants, but is not now. Several have already suggested and advocated its use in photography.

The Photographic News, June 25, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Late O. G. Rejlander's Pictures—Variations in Dry Plates—Instantaneous Shutters and Polarised Light—A Little Incident.

The Late O. G. Rejlander's Pictures.—There is a melancholy sight just now in some of the minor print shops in London. Side by side with the portraits of brazen-faced ladies (mostly French and American) in scanty costumes and in vulgar and ungraceful attitudes are to be seen many of the studies of Mr. Rejlander, unapproachable in his day, as in our own, for his artistic perception of what photography is capable. The studies are badly printed and slovenly mounted; some are inferior to others, but all show that originality of treatment and idea inherent to everything which Mr. Rejlander produced. In a little shop in the neighbourhood of Leicester Square, where the majority of the pictures shown in the window seem but suggestive of less nice ones to be obtained within, the cruel irony of fate has placed a ten by eight study, under which the intelligent shopkeeper has written, in an execrable scrawl: "O. G. R. as is own modle" (*sic*). This is, indeed, the fact. The artist photographer is standing with the chest and shoulders nude, and the lower part of the body enveloped in drapery, the folds of which are in themselves a valuable study. The head is bent, and the features are half concealed by the hand, which is raised to the face. The whole attitude and arrangement forcibly suggest shame and grief at the folly and degradation by which he is surrounded, and appeal silently and pathetically to the spectator. Does it not seem a reproach to photographers that, on the death of Mr. Rejlander, his collection of negatives, exhibiting an almost inexhaustible play of fancy, should have been allowed to drift into the hands of unsympathetic dealers; that a host of inferior efforts, which the artist himself would never have permitted to go forth, should have been dragged to light; and that, worst of all, some should be fated—we mean his studies from the nude—to be classed among those pictures which a noble art has been debased to produce? To our minds, nothing in the history of photography is so sad as this; that the man whose whole aim was to raise the photographer to the position of an artist, who worked in a time when the idea of photography being classed as a fine art was laughed to scorn, and who extorted admiration for his genius from the scorners, should now only be known to the public through the medium of all that is degrading and vicious. In an exhibition of photographs to illustrate the progress of the art from its earliest stages—an idea which may be carried out some day—Rejlander's pictures should occupy a prominent position; but unless the negatives are speedily collected, there will be very little chance of the next generation knowing much of what he did.

Variations in Dry Plates.—One of the most singular characteristics of gelatine plates is the variations they display when in different hands. We hear one photographer enthusiastic over the unapproachable qualities of the plates sent out by Mr. A. The next one cannot use A.'s plates at all, but swears by B.'s. B.'s are denounced in no measured terms by a third, who contends there is nothing under the sun so fine as C.'s, and so on. It is a mortifying thing, after a man has vaunted his success with a particular variety of plate in his own studio, to fail in convincing you in yours, and to be unable to explain the cause. An example of this kind of thing happened a short time since when a clever photographer who had prepared a number of plates after a formula of his own wished to show off their merits to a brother photographer, himself an experienced hand at dry plates. The plates were brought, their virtues expatiated upon, exposed, developed; result, a dismal *fiasco*. A multiplicity of suggestions all more or less unsatisfactory as to the reason of failure, followed, until at last, in despair, the preparer of the plates exclaimed, "Well, I'm as certain as possible, if I had exposed these plates in my own studio, that every one of them would have been a success." And no doubt he was right. At the same time, it is not to be supposed that the conditions were the same. Wherein the difference lay it was of course difficult to tell; but that there was a difference, either in the apparatus, the dark room, or the manipulation, is clear as noon-day. In making experiments of this kind, we fancy photographers do not always proceed with scientific accuracy. Some little point of detail which may appear insignificant is often sufficient to cause wide variations. The hot controversy which has been raging respecting the efficacy of canary-coloured medium as against ruby glass, and the entirely opposite experience of those who have tried the former, show the folly of expecting things to produce the same result when the circumstances are not exactly similar.

Instantaneous Shutters and Polarised Light.—Some curious effects of sunlight as seen through a narrow slit, which have lately been observed by Lieut.-Commander Nicholson, who called attention to the subject in the New York Academy of Sciences, seem to have some bearing on the question of instantaneous shutters. As the slit was diminished Commander Nicholson found the diffraction bands spread out and separate, until nothing is seen but the central light space; and when the slit became 1-100th to 2-100ths of a millimetre in width, the light became slightly bluish, and a Nicol prism revealed in it traces of polarisation. On further narrowing the slit the blue tint and the polarisation become more decided; and when a width of about 0·001 millimetre had been reached the tint changed to violet, and the polarisation appeared to be complete, the polarisation being in a plane at right angles to the slit. It has been suggested that the polarisation is caused by most of the light reaching the eye being reflected from the edges of the slit, but there is an objection to this theory on the ground that although the experiments were made with slits in iron, brass, and obsidian, the results were the same, whereas a difference in the material should have produced a difference in effect. It is also contended that were the polarisation the result of reflection it should also be observed when the slit is wide as well as narrow, which is not the case. The experiments, at all events, certainly prove that light when passing through a very narrow slit is polarised, and that the shorter waves of light pass more freely than the longer ones. Now in some forms of instantaneous shutters where a slit passes rapidly over the plate, is it not possible that the conditions may approach those just described? If so, the question of the position of the shutter in relation to the plate may become a most important one. There may be nothing in it photographically, but we throw out the hint to some of our clever philosophical workers as one worth investigating.

A Little Incident.—It is not often that the President of the Photographic Society is taken aback, but this certainly happened at the last meeting, when, in the midst of the exhibition of instantaneous shutters, a member who had signified that he had something to exhibit rose in obedience to the call of the president. Of course, everyone expected he was about to demonstrate some new form of shutter; but instead of that, he gravely said, "Mr. President and gentlemen, I have brought with me a specimen of a retouching pencil which, so far as I have been able to find out, will not do a single thing which it is advertised to do," and then as gravely sat down. We do not know whether the gentleman intended a practical joke, but it certainly looked very much like one. The President, when he had got over his surprise, mildly pointed out that it was instantaneous shutters upon which the meeting was engaged, and another member's shutter coming to the rescue, the proceedings regained their wonted solemnity and calmness.

At Home.

MR. J. W. SWAN, AT NEWCASTLE-UPON-TYNE.

Many of our readers will envy us an afternoon spent in Mr Swan's laboratory, but we will do our best to share the benefit of it with them. Mr. Swan has always been a pioneer in photography, and where he does not originate, he makes such sound improvements, that he never fails to leave his mark upon any branch he has to do with; and there are few branches to which he has not given attention. The names of carbon printing and Swan are synonymous: and if the photo-relief process had not been so timely secured to himself by Mr. Woodbury, the eminent Newcastle chemist would have made it his own. Mr. Swan preceded Baron Von Lenk by some years in the manufacture of guncotton from "slobbings and rovings" instead of from cotton wool, for soon after the Exhibition of 1851 Mr. Swan commenced to prepare pyroxylin from this description of cotton, and has continued to do so for collodion making ever since. When the news was flashed from America twelve months ago that Mr. Edison had at last found out the way of lighting up our dining rooms and libraries with electricity, by the simple expedient of rendering incandescent a tiny horseshoe of carbonised paper, it was found that Mr. Swan, quietly working in his laboratory at Newcastle, had made the discovery some time before, and, moreover, had taken the precaution to patent it. He has now gone far ahead of his American confrère. We passed the other evening in Mr. Swan's drawing room lit up by electricity. A tiny glass drop, which was no other than an exhausted bulb, depended from two electric wires in the centre of the room; the wires passed into this vacuum, and a little loop of carbon thread therein—for all the world like a bit of horsehair—became incandescent, furnishing a light so soft that it could be stared at with impunity. A petroleum lamp and a candelabria in the same room did not even look yellow, so mild and subdued was the luminous carbon. We measured its luminosity, and found the same to be equal to fifty candles, and afterwards, placing it within ten feet of a model, secured a photograph in the camera with an exposure of one second.

As Mr. Swan has of late occupied himself with the preparation of gelatino-bromide, it goes without saying that he has made himself master of this new and delicate branch of photography. At the same time Mr. Swan is no enthusiast; on the contrary, he is somewhat sceptical upon the matter of new phenomena, and is more likely to disbelieve than to adopt a novel dictum. If you propound a theory in development or express a belief in the special treatment of a film, he puts his hands behind him, and permits you the privilege of demonstrating the fact yourself, placing apparatus and chemicals at your disposal for the purpose. If you succeed, well and good; if you fail, he does not congratulate himself upon his foresight, but, like a generous foe, straightway proceeds to help you, repeating the experiment himself, to be quite sure that nothing has gone wrong, and that the theory expressed shall, at any rate, have every chance. The matter of development in the light, or rather commencing the development of a gelatine film in the dark, and continuing the operation in subdued light, did not answer in Mr. Swan's hands, for half of the plate which had been treated entirely in the dark proved, on careful comparison, the better and brighter. At the same time, he was ready to admit that in the case of a comparatively slow plate, and under the action of very subdued light, a gelatine film, especially in the non-actinic oxalate developer, would not be likely to suffer to an appreciable degree.

Mr. Swan, in the manufacture of his plates, fully believes in the addition of a small proportion of iodide. We mentioned the opinion of several photographers who were unable to detect any difference between a film prepared wholly with bromide and one containing a proportion of iodide. Said Mr. Swan, you must be quite sure that there is iodide of silver in your plates before you make comparison; it is possible to employ an iodine salt when making your emulsion, and yet not form any iodide of silver, or, at any rate, get any of it in the finished product. But whether there is iodide present or no, is soon apparent on taking the films into daylight. "In this case you have only bromide of silver present," said Mr. Swan, showing us a series of plates of a pale primrose colour, which, when held up against the light, could scarcely be called opaque; "while here, again, this brimstone colour proclaims the presence of iodide of silver." These latter films were quite opaque, and this test, therefore, we commend to our readers as one that is likely to stand them in good stead. The plates must be examined as soon as they are brought into the light, as their tint changes after exposure for a minute or two; and in judging their colour look at, and not through, the films.

The presence of iodide, therefore, from the fact that it gives a more opaque film, and thus prevents blurring, is an undoubted advantage, while for the same reason it adds vigour to the image. Mr. Swan also believes that the addition of iodide is of value in contributing towards clear shadows and vigorous high lights.

As to the quality of the bromide formed and the nature of its particles, whether coarse or fine, of which we have heard a good deal of late, Mr. Swan has no hesitation in saying that the coarser the particles, the more sensitive is the bromide. Moreover, he believes that the colour seen, when viewing a glass plate coated with emulsion, as a transparency, is not due to the emulsion itself, but simply to the passage of light between the particles; that is to say, when the particles are fine, the light transmitted appears to be orange or red; while if the bromide particles are of a coarse nature, the light transmitted is grey or blue.

Notwithstanding the greatest care in emulsifying and preparing the plates, Mr. Swan finds it impossible to control the sensitiveness within certain limits, and for this reason he adopts the common-sense plan of carefully testing the plates by a standard after the emulsion is made, and recording this sensitiveness. In this way he knows what he has made, if he does not know how he has made it. Every batch of plates is tested for density, sensitiveness, frilling, and spotting. The plates after coating are permitted to set —under an hour is the time necessary—and then dried in an atmosphere very slightly raised (between 70° and 80° Fah.) for a period of twenty-four hours. They are then packed, not only with a view to shelter them from light, but also from that arch-enemy to gelatine, damp (the packing we need not describe, as any purchaser of the plates can examine it for himself), and they then come before the inspector. One assistant is engaged on no other work but that of inspection, and it is his duty to take haphazard a per centage from every batch for trial. The plate is put into a printing frame under a standard negative of known intensity, at a distance precisely of ten feet from an ordinary fish-tail gas-burner. A standard developer is employed, and a sand glass that runs exactly three minutes and a half serves to fix the time for the plate to remain in the developer. With these fixed conditions, the sensitiveness of a batch of plates is soon determined approximately by an experienced assistant, and he then decides whether the plates are 5, 10, 15, 20, or 25 times quicker than wet collodion, information that is at once marked outside every packet of the batch. In respect to fixing, Mr. Swan makes a point of it that gelatine negatives should be permitted to remain in the hyposulphite bath *not less than an hour*, for the film is so much less permeable than one of collodion; while a correspondingly long time is necessary for its sojourn in water afterwards, to allow the gelatine to discharge the salt perfectly.

Mr. Swan showed us an interesting series of negatives illustrating the effect of strong and weak developers, and the influence of varied intervals of development, in order to prove the control that may be exercised in coping with under- and over-exposed films. His normal developer in this case was six grains of ammonia and six grains of

bromide dissolved in one ounce of water on the one hand, and on the other, pyrogallic acid dissolved in one ounce of water in various quantities. Thus we saw plates (all with the same exposure) developed with half a grain, a grain, and two grains of pyrogallic acid, and further examples showing the effect of these developers after an interval of two minutes, three minutes, and six minutes. Mr. Swan believes that many failures in development are due to employing ammonia of not sufficient strength, and pyrogallic acid not freshly prepared. The whole formula obviously is deranged if attention is not paid to these details.

As our readers know very well, Mr. Swan recommends the employment of bromide of potassium for retarding the developing action when oxalate is employed, the bromide solution being used in the same way as when alkaline pyrogallic acid development is undertaken. Our readers know, too, that Mr. Swan has of late applied the gelatino-bromide to opal plates, but they are probably unaware that he has successfully applied it to paper. We may, therefore, expect shortly to have rolls of the sensitive material supplied us for positive, and perhaps negative work, in the same way as M. Warnerke was wont to provide us with collodion tissue. But Mr. Swan has hardly got so far at present, and the sensitized paper he shows us now is adapted more especially for positives printed direct or enlarged. He places a piece of this paper under a negative, exposes it for ten seconds at a distance of ten feet from a fish-tail burner, equal to one-tenth part of a second, it must be remembered, at one foot from the source of light. In developing upon opals or paper, only the oxalate solution can be employed, for there must be no suspicion of brownness in the finished result. Mr. Swan puts a little bromide solution into his bath, for in the case of positives it is necessary that the development should not be hurried. The picture appears gradually, and in about four minutes it is satisfactorily developed. It is the most rapid printing that can be conceived, and in the case of enlargements this gelatino-bromide paper will be exceedingly useful. The picture printed in our presence had almost an enamelled appearance, so soft and transparent were the details. An Argand burner or petroleum lamp would give sufficient illumination for making enlargements in this way; the image being simply projected magic-lantern fashion upon a wall covered with a sheet of this paper; an exposure of a few seconds would suffice. As to toning, gold must not, of course, be made use of, on account of the gelatine; but there are several means of modifying the colour of the impression, if that developed by ferrous oxalate is not approved. Treatment with bichloride of mercury, followed up by washing with ammonia, and a second application of the bichloride, gives a brown tone that is far from unpleasant.

In removing the film from a gelatine plate, when such a thing is desired, Mr. Swan has recourse to the employment of methylated spirit for hardening; that is to say, when the film has been alumed and floated off by the application of a little very dilute hydrochloric acid, he toughens and contracts it again by immersion in spirit, when the film may be handled without much fear of the consequences. Whether the operation can be done in the case of paper remains to be seen.

Mr. Swan's laboratory is an *affaire de luxe*; it opens into a glass corridor, at the one end of which is a dark closet, and at the other a fine glazed studio. The laboratory is a most agreeable apartment, being, in fact, Mr. Swan's library, which is converted by very simple means into a dark room. The two doors are provided with strips of list, and with mats fitting into the threshold, so that no light passes them. The large window is covered with a four-fold thickness of orange paper, and the lights of the gaselier—with the exception of one jet that is turned up now and then for testing—are provided with ruby chimneys. The orange paper, by the way, is of Mr. Swan's own preparation, and has been made especially for his plates.

There is a tap and sink in one of the cupboards, and some big porcelain trays with hyposulphite and alum conveniently at hand. You have simply to turn the keys of the two doors and lower the gas, and you are in a dark room that is by no means dark. But with his very sensitive plates, Mr. Swan has to take care, and therefore he has his developing dishes provided with covers, which are employed as frequently as possible.

In respect to the gelatine which is most suitable to the preparation of plates, Mr. Swan agrees with the opinion as expressed in these columns a few weeks since. He does not mind gelatine that is a bit turbid; in fact, he does not lay much stress at all upon this quality, so long as the material is otherwise sound. But he will have nothing to do with gelatine that contains traces of acid, no matter how transparent it may be. Mechanical tests, or its capacity for absorbing water, are not gone into, but, on the other hand, no sample is approved until it has been actually tried for emulsion making.

Mr. Swan's extensive premises in Mosley Street, which were utterly destroyed some months since by a disastrous fire, are being steadily re-built; and we embraced the opportunity of visiting the spot. Despite the advent of gelatino-bromide, the demand made upon Mr. Swan just now for collodion is, curiously enough, much greater than for some years past. There is usually a stock of this material, to the amount of from three to five hundred gallons, upon Mr. Swan's premises, for he has great faith in permitting it to stand several weeks before decantation; but, fortunately both for Mr. Swan and the city of Newcastle, the fire did not attack this portion of the premises. Only sufficient for the day's packing is brought into the central premises, and in the packing room there is not a single gas-burner, the lamps being fixed outside the windows. Nay, more, to prevent any injury that might arise from fumes of collodion escaping, the packing and store rooms are made pretty well air-tight, and are, moreover, carefully cut off from the rest of the building.

The next "At Home" will be "M. Liébert, in the Rue de Londres."

THE PRODUCTION OF DUPLICATE NEGATIVES WITH GELATINE EMULSION BY MEANS OF SOLARISATION.

Dr. J. M. Eder writes:—When a bromide of silver plate is exposed a hundred times or several hundred times longer than is necessary to give a good negative picture, and when it is afterwards developed, it will be found that the parts of the image where the light has acted most intensely will develop very thinly and slowly, while the shadows, in which the light has not acted so freely, will develop more vigorously and more intensely. Bromide of silver which has become solarised by long and excessive exposure develops much more slowly than the bromide exposed for the ordinary time. This same phenomenon will be observed in the case both of collodio-bromide and of gelatino-bromide.

If a gelatine plate be exposed for a few seconds under a negative to diffused daylight, an ordinary positive will be produced after development; but if the exposure be continued longer (say upwards of half a minute) the plate will be much fogged, becomes partially solarized, and appears to be in a state of transition from a positive to a negative. The transparent parts will already have a negative appearance, while the opaque spots still remain positive. With a longer exposure the change to a negative becomes still more complete, and after from three to four minutes, about the time necessary to expose a carbon print, the transformation will have been quite accomplished. The different parts of the image on the plate appear to be solarised to various

degrees, and the whole when developed gives a duplicate negative.

If the exposure be continued for a still longer time, from six to nine minutes, the solarisation will become extended over the whole plate, and what we may call the "solarisation negative" gradually disappears under ordinary circumstances. Duplicate negatives of this kind are so highly fogged as to be practically useless.

In order, therefore, to make this process workable, we must endeavour as far as possible to augment the solarisation. Captain Abney has shown that solarisation is really due to oxidation, and that by the addition of oxidising substances the solarisation can be materially increased. Mr. Bolas, who has pursued the subject in practice, dips an ordinary gelatino-bromide plate in a bath of a 5 per cent. solution of potassium bichromate, and, after drying it, he exposes it under a negative. Under the influence of light the potassium bichromate gives off oxygen, and hence the oxidation of the silver salt, by the action of the rays of light (or, in other words, solarisation), is promoted. The parts that have been exposed oxidise much more rapidly than is the case with those of an ordinary gelatine plate, and the transformation of the positive to a negative is accomplished much quicker and more perfectly. By this method, therefore, the multipication of negative by means of solarisation is materially improved, in that the oxidising action of sunlight is furthered by the addition of potassium bichromate.

Solarisation, which up to the present has always been considered as an evil, and which on that account has been a cause of dread, may now be itself converted to serve a useful purpose in photography. It may possibly be largely taken advantage of in practice, and in the future it may be called on to play a not unimportant part therein.

THE REPRODUCTION OF NEGATIVES IN A REVERSED DIRECTION, BY THE INVERSE ACTION OF LIGHT ON GELATINE PLATES.

BY T. BOLAS, F.C.S.*

The reproduction of negatives in a perfectly satisfactory manner is not by any means easy, as the various gradations of opacity which exist in a good negative can only be fairly reproduced by a most accurate proportioning of the development to the exposure, and the fulfilment of some other conditions.

The conditions of satisfactory reproduction are rendered much more difficult to fulfil when a transparency has to be first made, and the negative is then to be produced by a second operation. In fact, those who have had most experience in the reproduction of negatives generally admit that a first-class picture, almost invariably, is deteriorated by reproduction; while a second-class one, containing a less complete range of tone, may be reproduced without any deterioration.

Reversed negatives are now a necessity for several processes of considerable importance, such as the single transfer carbon process, collotypic printing, and the new Woodbury method in which tinfoil is the moulding material; and this circumstance very much lessens the usefulness of these processes. A photographer who has produced a negative naturally objects to running the risk of having it stripped, and, on account of the uncertainty of obtaining a good result by reproduction, he often rejects a printing method which he would otherwise avail himself of.

The process about to be described arose out of some experiments in connection with the Pretsch process. Plates containing bichromate and bromide of silver, having been treated, after exposure, with ferrous oxalate, it was found that the inverse action of light had so far changed the silver bromide as to lead to the development of a reproduction of the original picture: those portions of the plate which had received most exposure remaining clear under the developer. and those portions which had been exposed under the opaque parts of the original became opaque. These results accord well with some experiments which Capt. Abney has recently made on the oxidising action which a bichromate exercises on those portions of the bromide in an ordinary gelatino-bromide plate which have been acted on by light in the usual manner.

It is well known that the inverse action of light sets in the case of an ordinary gelatino-bromide plate, but the action is not sufficiently vigorous to render it practicable to reproduce a negative by taking advantage of it.

A gelatino-bromide plate is soaked for a few minutes in a four per cent. solution of potassium bichromate, and after this it is rinsed for a few seconds in a bath composed of equal volumes of alcohol and water. On removal from the alcohol bath, it is laid down on its back, a piece of clean blotting-paper is laid on its face, the paper being pressed gently into contact with the plate by means of a cloth. The paper being now removed, the surface of the plate will be found to be free from any superfluous moisture, which might tend to accumulate into drops during the drying; and it should be next placed in a warmish place to dry. When dry the plate is to be exposed under the negative which is to be reproduced, the exposure being about the same as one would give in making a carbon print from the same negative—say two, three, or four minutes in moderate sunshine, or ten to fifteen minutes in a good diffused light. After exposure the plate will be seen to be impressed with a very delicate and perfect positive impression, owing to the darkening action of light on the argentic bromide, and also to its action on the bichromatised gelatine. The plate must next be soaked in a few changes of cold water, in order to remove the excess of potassium bichromate; and this having been done, any developer which is suitable for gelatino-bromide plates is to be poured on, but a pyrogallic acid and ammonia developer appears to be, on the whole, the most suitable.

Under the action of the developer the nature of the picture rapidly changes, the light parts becoming dark and opaque; while the parts already tinted by the action of light either become actually clearer, or appear to do so by contrast. The positive having been thus converted into a sufficiently dense negative, the plate is rinsed with water and cleared with hyposulphite of sodium in the usual manner.

In the case of the above described process, undue exposure tends to give a flat picture which develops rapidly, while over-exposure results in the production of a hard picture which develops slowly.

In demonstrating his process, Mr. Bolas said: Here is a gelatino-bromide plate on which an impression has been printed sufficiently long to darken the bromide. Previous to the printing the plate was soaked in a solution of bichromate of potash, and dried. What Capt. Abney has told us teaches us that for this purpose we may use a plate that has been exposed to light either in or out of the camera. After the printing of the plate all traces of bichromate were removed by washing. Here is another plate similar to the first. This I will pass round for examination; the other I treat with the ordinary developer, pyrogallic and ammonia. I have noticed that photographers, generally speaking, use glass beakers for development, these being remarkably invisible in the dingy light of the dark room. Porcelain cups, however, are quite the reverse, and I therefore use them for the purpose. If the developers are poured into the same vessel from the two bottles, imperfect mixture of the fluids often leads to the production of streaks on the plate. There is an American practice of mixing drinks, which consists in pouring from one vessel into another and back again, and this process of manufacturing a "corpse reviver," or "brandy smash," can be imitated with advantage in mixing the developer. The positive in the dish is now rapidly changing to a negative, the black parts turning white. It is now converted into a negative, though not sufficiently dense for printing, but density will be gained by allowing it to remain in the dish. In this mode of reproduction I see very little difference in detail between the original and the duplicate, though they can be easily distinguished, because one is developed by ferrous oxalate, and the other by pyrogallic. It should be also mentioned that in the reproduction the position is reversed, the right hand becoming the left hand, but this is the especial advantage of the process, as it affords a negative suitable for collotypic printing or the new Woodburytype process.

* Read before the Photographic Society of Great Britain

A NEW INSTANTANEOUS SHUTTER.

BY G. L. ADDENBROOKE.

So many instantaneous shutters have been invented within the last year or two, that one cannot help feeling some diffidence in introducing another to the notice of photographers. The one about to be described is, however, I believe, new in principle, and has these advantages: it works just in front of the plate; gives a longer exposure to the fore-

ground than the sky; is light, simple, and portable; and can be furnished, if desired, with an arrangement by which the length of exposure may be considerably varied by the exercise of a little care.

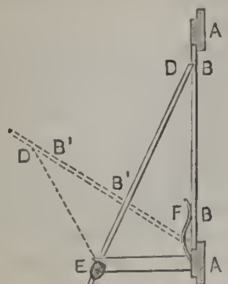

Fig. 1.

AA is a light wooden frame fitting into the back of the camera by a slight groove round its outer edge, and held in its place by a bolt. BB is a movable shutter inside this, working on cloth hinges. At C there is a projecting piece of brass forked at the end; into this fork is hitched a bead, terminating in an india-rubber band fastened to the shutter at D. E is a piece of spring. The whole arrangement is clearly shown in Fig. 2.

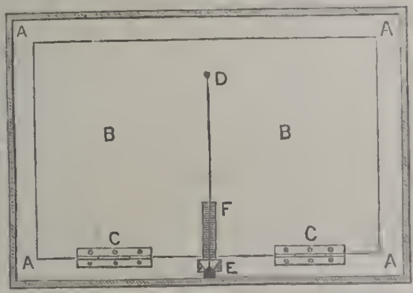

Fig. 2.

Its action is as follows:—The shutter, held in its place by a spring catch, is released by pressing a small pin which projects through the top of the camera. It is now drawn into a horizontal position by the india-rubber band, the bead then slips out of the fork in C, and the spring E, bent by the fall of the shutter, immediately returns it to its perpendicular position, where it is retained by the catch.

In what trials I have made, the shutter has worked with certainty and accuracy, whilst the confined state of the air in a camera causes its action to be smooth and noiseless. By using a whole-plate camera and shutter for taking cabinets and cartes it will readily be seen that the time of opening and closing will be relatively short compared with the time during which the full power of the lens acts on the whole surface of the plate.

I do not say that the shutter is quite perfect, but it has many great advantages, and, I think, can be fairly said to be nearer theoretical and practical perfection than those in use at the present time. Not the least advantage connected with it is that, being entirely inside the camera, there is no risk of diffused light reaching the plate during exposure.

For professional photographers to whom time is an object I should recommend the use of three shutters giving exposures of (say) half, quarter, and one-eighth seconds; they would be always ready, and whichever one it was decided to use would be placed in the camera in a moment before inserting the dark slide.

In order that those who care to try the shutter may be able to obtain one properly made, I may mention that Mr. Hare, of 26, Calthorpe Street, W.C., who carried out my own, has agreed to execute any orders sent to him.

GELATINO-BROMIDE AT MUNICH.

BY RUSSELL MANNERS GORDON.

HAVING lately had occasion to visit Munich, I took the opportunity of calling on Herr Obernetter, to see him work an emulsion of which I had for some time past heard great things, and also, if possible, to compare it with plates I had by me of English manufacture, said to be some of the best at present in the market.

I had always imagined, till I saw the result of this comparison, that we in England were "a-head" of everyone in the matter of gelatino-bromide, but I left Munich of a different way of thinking.

For our first experiment one of my plates was cut in half, one of his also; they were then placed side by side in the same dark slide, and exposed in a stereoscopic camera (view lenses, small stops, and flap shutter) for one second, the camera being pointed at a block of buildings opposite his laboratory, with a few trees in the foreground.

The two plates were again placed side by side in a tray, and developed together with ferrous oxalate, his was finished and had to be taken out of the solution before mine was half done; his had a pull over the English plate of (I should say) about one-fourth in rapidity, and, what was very remarkable, was the difference in the intensity, for whereas mine was feeble, and would have required a considerable amount of intensification to bring it up to "printing pitch," his was, if anything, almost too intense.

Several other comparative experiments were made, the advantage being always on his side; he also took a portrait in the studio with an aplanatic lens and drop shutter, the resulting negative being fully exposed and fully intense.

I have since worked some of the plates against English commercial ones, with all manner of developers, the result being that I got always the same full intensity in his plates when using as little as one grain of pyrogallic to each ounce of developer, and this combined with a maximum of sensibility.

He attributes his success to a peculiar method of preparing the emulsion, which gives it sensibility and density at one and the same time. Unfortunately, the method he adopts will not permit of his turning the emulsion into pellicle, or I would send you some to experiment with.

His emulsion evidently contains no iodide, for the plates fix with unusual rapidity in the hyposulphite bath.

Before closing this note, allow me to ask if any of your correspondents can help me to a sure method of intensifying gelatine plates with silver? I have occasionally been able to so treat them when using some of the less sensitive emulsions, but it is altogether another thing if the silver bromide has passed into the so-called green stage of extreme sensibility; it is then, in my hands at least, impossible to get the films to "accept of silver" in any way whatever.

A crown of glory awaits the man who will give us a certain method of intensification with silver, after fixing, for that appears to me to be the only thing wanting to perfect this most marvellous process.

[Singularly enough, we have received from a German gentleman a note touching upon the character of the gelatine employed by Obernetter, an extract of which we append. "Our German experimentalists generally employ the gelatine of Fischer and Schmitt, of Hoechst-on-Main. There are two qualities, P. L. and D. W. The former is a material specially made of the same quality as Nelson's, which is, as you know, everywhere recommended. Obernetter likes this quality; others object to the brownish colour (like Nelson's) and somewhat turbid solution; these take D.W. (star gelatine), and are pleased with it, though it contains slight traces of sulphurous acid, hydrochloric acid, and phosphate of lime. D.W. is cheaper and better looking." Obernetter is evidently a wise man.—ED. P. N.]

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INTENSIFYING GELATINE PLATES WITH SILVER.

A VALUED correspondent, Mr. Russell Manners Gordon, whose familiar name will be welcomed by our readers, after a long period of silence, recalls to our mind the subject of intensifying gelatine plates with silver. Mercury, which is now generally employed, though serviceable enough in some respects, leaves much to be desired; but it is more easy to employ with gelatine plates than silver. The gelatine film is but slowly acted upon by the latter, for the obvious reason that the silver particles of the image are buried in the film, and do not lie upon the surface as in the case of the wet collodion process. Moreover, gelatine itself, it must be remembered, is not indifferent to nitrate of silver solution; this, in part, combines chemically with the gelatine, and in part is physically absorbed by the film. For this reason it is that the turbid growing silver intensifier cannot be removed quickly enough from the plate. Spots speedily make their appearance, and become very prominent indeed if every trace of hyposulphite has not been removed from the negative, and very likely, into the bargain, the film gets covered by that red fog so dreaded by all gelatine workers.

To work with certainty with a silver intensifier, it is indispensable that every trace of hyposulphite should, first of all, be removed. This is best done, in our experience, by immersing the plate for a few minutes in a sherry-coloured solution of iodine in iodide of potassium; or a dilute solution of permanganate of potash (say 1 : 500 or 1,000) will effect the same purpose. The plate is then rinsed, and you may begin.

Intensifying with iron and silver we have found easier than with pyrogallic acid and silver, as the pyrogallic has a tendency to give the plate a yellow or brown tinge. The solution of iron should contain plenty of acid, and sugar or gelatine renders it quicker in its action. It should not contain more than two or three per cent. of protosulphate of iron. The combination of acetic acid and gelatine (according to Wratten and Wainwright's formula) is an exceedingly good one, as many of our readers know. Sugar with tartaric acid or citric acid (the per centage being the same as for protosulphate of iron) has also given us good results. The nitrate of silver solution, it will be found, may with advantage be treated with about five per cent. of nitric acid, which prevents its growing turbid too rapidly.

The same holds good in intensifying with pyrogallic acid; plenty of acid must be used in this case too. The yellow colour due to the pyrogallic acid may be discharged from the film by using a solution of common salt, or, with care, very dilute hydrochloric acid can be employed for the same purpose.

It seems, however, almost impossible to save a negative once affected by a genuine red fog; this, we may mention, is due to the nitrate of silver solution, and always appears if the plate has been imperfectly washed before intensifying, or if the intensifier contains too much silver and too little acid.

One other important point we ought to refer to. There must be plenty of developer, and it must always be kept moving over the plate; neither should it be allowed to remain on the film for any time, fresh solution being constantly poured on. Inattention in this respect we have found to produce red spots. A thorough washing must also be given afterwards, or the negative will gradually grow darker in the daylight. It is a very good plan to fix a second time. Our readers will not find much difficulty in intensifying their gelatine negatives with silver, we can assure them, if they will follow out these recommendations.

REVERSED NEGATIVES.

MR. BOLAS, at the last meeting of the Photographic Society, read a paper on the production of reversed negatives, and we have, during the last week, experimented with the process described by him, though it may be with slightly different details. We may premise that the method is excellent and very simple. We took an ordinary commercial gelatine plate, immersed it in a saturated solution of bichromate of potash, and allowed it to rest for ten minutes, and then, following Mr. Bolas' direction, wiped it dry, and flowed over it a little methylated spirit, removed all excess of moisture, and then dried the film spontaneously. In one or two cases we were troubled with crytallization, but a little care soon got over the difficulty. When the plates were dry we exposed them in the sunshine behind a negative for from five to ten minutes, and then, after a lengthy wash, employed the ferrous oxalate developer with two or three drops of a thirty-grain solution of potassium bromide to the ounce of solution added. The effect was curious at first; the visible image was very strongly marked, but, as the developer acted, the surface appeared to darken all over to one uniform dark tint, after which the previous white parts blackened, leaving the original image light by contrast. On fixing the plate in hyposulphite of soda we were somewhat astonished to see that the original printed image had nearly, if not entirely, disappeared. If any one takes the trouble to expose chloride of silver to blacken in the light, and then to dissolve away the unaltered chloride, it will be found that there is always a certain amount of metallic silver left behind, which, on a glass plate, is decidedly perceptible. With the bromide of silver film this residue seems to be decidedly less, and we have no doubt that with an iodide emulsion it would be less still, though the latter would be well nigh undevelopable by the alkaline developer, and would, consequently, be useless to employ.

On examining the image we were struck with its great delicacy; it presented a decided contrast to a reversed negative produced by the method we described in our columns some years ago, of developing the image on a collodion emulsion film, and then dissolving away the metallic silver with nitric acid, and finally blackening the bromide left behind by one application of the alkaline developer. By the gelatine process the margins of the image appeared to be much less ragged (if such an expression may be used) than with the collodion process, and there was not that hardness which was so apt to characterize a negative formed by the earlier method. The negatives certainly were successful in every way, and the method should prove useful. There is a certain tendency to frill with some plates, and this we surmounted by giving a coating of plain collodion to the plate as recommended by Captain Abney on the same evening as that on which Mr. Bolas read his paper. To fully test the process we took another negative from one already reproduced,

which, of course, gave the image in its original position as regards right and left. We obtained prints from the original, and also from the second reproduction. They were very similar, though, perhaps, there was a little more contrast in the print from the latter than in that from the former; but it must be remarked that the original was a fully-exposed aud a decidedly slow-printing negative. With thin negatives the process did not yield in our hands such good results as when a "plucky" oue was used, but it was probably due to want of practice, and a judicious management of the developer might probably give much more favourable results. We believe that Mr. Bolas has done good service to photography in bringing the subject under review, and it only remains for those to whom reversed negatives are a desideratum to master its details, and make the process one of everyday practice.

Notes.

The Annual Exhibition of the Photographic Society at Pall Mall will open on Saturday, the 2nd October, and close on the 13th November. Friday, September 24th, is the last day on which pictures can be received. The judges appointed to award the medals are James Glaisher, F.R.S., S. Marks, R.A., Henry Moore, Captain Abney, R.E., F.R.S. Mr. Baden Pritchard, F.C.S., Mr. F. M. Good, and Mr. J. Gale.

We have still enquiries addressed to us on the choice of gelatine for the preparation of emulsion, and would again emphatically advise the adoption of a gelatine a little turbid rather than one containing traces of acid, however transparent it may be. Turbidity is of little moment in a thin film, but acid may work much mischief. It is true that chloride of silver may be formed in some circumstances if the acid happens to be hydrochloric, but not under the conditions in general use for the preparation of emulsion. When an excess of soluble bromide is employed, the silver combines only with the bromine, and the result is a pure gelatino-bromide emulsion, notwithstanding the fact of there being so much soluble bromide at hand.

It will be within the recollection of our readers that the carriage of pyroxylin through the post has been forbidden by the postal authorities in Germany on account of the risk of fire and explosion; but this law, photographers will be glad to hear, does not apply to celloidin, the jelly-like mass that has of late been much used in the studio in place of simple gun-cotton.

A prize of five hundred francs, given by M. Gaillard, is offered by the French Photographic Society for a light unbreakable film as a substitute for glass in negative work. The competition is open to all the world, but candidates for the prize must send in their names before the last day of this year. Seeing that the Vienna Photographic Society has in vain offered a more valuable prize, for some years past, to any one attaining a similar object, we fear there is little chance of this latter attempt effecting its object.

We have great pleasure in announcing that our esteemed correspondent, Dr. J. M. Eder, has been appointed lecturer in the Technical High School of Vienna to hold courses of instruction in photo-chemistry.

A photographer we wot of has been curing the evil of a damp wall by the application of a coating of bichromated gelatine. He put some bichromate into his sizing solution, and applied it with a brush. The daylight did the rest, for it "printed" his wall, aud thus covered it with an excellent varnish which bids defiance to all moisture. This application of bichromate to sizing, or glue, was, we believe, patented in this country some years ago.

Films of bichromated gelatine acted upon by light were cited at the last meeting of the Chemical Society as a convenient material for dialysers. The dialyser, as everybody knows, is a utensil with a bottom of parchment paper, or membrane, to hold solutions from which salts are to be extracted; the dialyser stands in water, and gradually the salts, by the law of diffusion, make their way gradually through the membrane into the water below. A thin film of gelatine rendered sensitive by the addition of bichromate, and exposed to daylight, was stated by Mr. F. Page to furnish an efficient dialysing diaphragm.

We need hardly remind our readers that the same material was employed for sausage skins during the Franco-German War. The demand for the famous pea-sausage was so large that butchers could not supply skins fast enough, and neither greased fabric nor parchment paper would answer the purpose. In this strait, the expedient was chosen of dipping the sausage mass into bichromated gelatine, and permitting the light to act upon this compound.

The death is announced in France of M. Tessié du Mothay. Among photographers he will best be remembered for his improvements in photo-collotype printing, which preceded those of Albert, of Munich. The process with which his name is connected demonstrated clearly enough with what perfection photographic impressions might be pulled from a gelatine film that has been suitably printed under a negative. The defect of his printing surface was that it would not yield more than eighty or a hundred impressions, but for delicacy these were unsurpassed. In all photo-collotype processes, since the days of Albertype, it is customary to allow the light to act upon the under surface of the gelatine (by permitting daylight to pass through the back of the glass plate), and thus render the printing film more firm and stable. Tessié du Mothay was the first, we believe, to effect this; he rendered his under surface insoluble, but without making use of the action of light, for he employed metal instead of glass. The insolubility in his case was effected by chemical means, and to this circumstance was due, in a great measure, the advance he made in photo-mechanical printing.

Dr. Adolph Ott, who forwards us a valuable contribution to the knowledge of gelatine, so far as it is employed in photography, is entitled to speak with some assurance on the subject, having for many years acted as chemist to the famous carbon printing establishment of MM. Braun et Cie., of Dornach. He shows that photographers require gelatine of two different kinds, according as the material is to be employed chemically or mechanically.

By the way, why do so many, in experimenting with gelatine plates, try to achieve the impossible? "I gave this plate but five seconds' exposure after eight in the evening," says one; "this film was developed with oxalate after a second's exposure in the camera on a dull evening at 6.55 p.m.," is the description given of another picture. And from the prints shown, one can well believe the data given, the details are so very imperfect and indefinite.

Such things vividly remind you of Albert Smith's friend, who took that well-known photograph of Strasburg by night. Albert Smith admired the picture so much the artist presented him with a copy. "You couldn't see anything on it," Albert Smith said; "but then, of course, you wouldn't see much of Strasburg either, on a dark night."

Topics of the Day.

EXAMINATION AND SELECTION OF GELATINE FOR PHOTO-MECHANICAL PRINTING.

BY ADOLPH OTT.

To my knowledge no rational method of examining gelatine has thus far been applied, even in photographic establishments where large quantities are used. In this respect operators mostly adhere to old notions, judging the quality from very immaterial signs, thus often selecting an expensive brand where a less costly article would have rendered the same service. Regarding gelatine, one finds in the literature of photography (with few exceptions) false and contradictory statements. Generally speaking, the source from whence the article has been obtained is not indicated, and there are even authors who, instead of elucidating the subject, wrap it up in the veil of secrecy. It is, therefore, not to be wondered at that operators who are to solve certain problems—for instance, the preparation of carbon tissues, or the making of reliefs for woodburytype—grope about in the dark, clinging to every notion, if it come from a professedly "practical man."

It has been said that gelatine is the "soul of the chromo-photographic processes," and it is, therefore, very satisfactory that light has been thrown on the matter, and that solid principles have been established for the examination of a product which in itself is one of the most changeable of organic bodies.

We will state here at once that the Photographic Society of Vienna has suggested these researches, and it is their good fortune to have found in Dr. Josef Maria Eder an investigator who has disposed of it to the fullest satisfaction of every *savant*. The researches in question are entitled in the prize-essay, "On the reaction of chromic acid and chromates upon gelatine, gum, and sugar, and other substances of organic origin, in their relations to chromat-photography," Vienna, 1878. In the subsequent paper we shall not adhere strictly to the essay in question, but, always considering the facts elucidated, treat the subject freely, whereby we shall also try to set forth our own experiences, which were obtained in the establishment of Messrs. Braun and Co. in Dornach.

In testing gelatine we have chemical and mechanical methods, of which, however. only the latter ensure safe conclusions. Two factors are especially to be considered, viz. (1) The power of absorbing water at a certain temperature; (2) The resistance against mechanical pressure. Conditions which may be supposed as self-evident are, that the gelatine, if covered with water for twenty-four hours, does not liquefy, and that it contains only a certain percentage of ashes. Eder found that gelatines containing over four per cent. are to be rejected.

With regard to the first condition, it may be stated, that the more water a certain kind of gelatine is capable of absorbing, the greater is its adhesive power, and the quicker it dissolves. In selecting gelatine for carbon tissue or for woodburytype reliefs, this "imbibition property" is of special value. The method of testing is very simple. A piece of a certain weight is put in water of 15° Cels., and left therein for twenty-four hours. After this time the swelled-up particles are taken up, dried with blotting-paper, and weighed. Dr. Eder says that gelatine capable of absorbing more than seven times its weight in water of 15° C. can be put down as one of the best kinds for photographic purposes. It is, however, not contended that gelatines incapable of absorbing so much are to be rejected, for we have excellent brands absorbing only five or six times their weight. Be this as it may, we are entitled to state, that all kinds with great absorptive power can be regarded as excellent articles, while if this is not the case, it is preferable to subject the brand in question to a still further proof. Of the greatest importance is the testing its resistance, especially where the gelatine is to be used for collographic printing, in which the plate must often bear several thousand prints. The greater or lesser power of resistance offers also a criterion, it having been ascertained that an inferior brand can only be submitted to a light pressure.

The following is the testing method:—In a cylindrical glass with open mouth, five parts of the sample are dissolved in so much warm water as to make the weight of the solution fifty parts. It is then left for twelve hours, and at a temperature of 18° C. (better 15° C.), to coagulate. Over the mouth of the glass a piece of tinned iron is now set, through the centre of which goes an easily movable wire. To its lower end a cup-shaped sheet of 1·5 centimetre diameter is soldered, turning with its convex part towards the jelly.

Wire with cup weigh together five grammes. To the wire a funnel is attached, weighing also five grammes. The latter must be capable of holding fifty grammes of fine shot. According to the consistency of the jelly on which the instrument rests, the funnel may be charged with more or less shot, the point to which it may be loaded without sinking into the gelatine affording a conclusion as to its adhesive quality. According to Dr. Eder, gelatine which is to serve for photographic purposes must bear over six hundred grammes, and gelatine which is to be used for collographic printing should at least bear seven hundred grammes. Especially serviceable for carbon tissue, the woodburytype, and photo-galvanographic processes, are: Nelson's amber gelatine, gelatine of M. Creutz, in Michaelstadt, F. F. Blanc, first quality, for collographic printing; the brands of Coignet père et fils in Paris, the "Lichtdruck gelatine" of Hochst-on-the-Maine (recommended by M. Albert, the celebrated phototypist), Moll's photographic gelatine (recommended by Husnik), and a French brand of unknown origin sold by Trapp and Munch.

I may observe that for carbon tissue, both brands of Nelson, the opaque as well as the transparent kind, are ex-

cellent. The opaque is best mixed with an easily soluble brand.

In the establishment of MM. Braun and Co., in Dornach, a certain brand of Rouen, France, is often employed; and for the woodburytype reliefs, I used preferably Nelson's amber gelatine. La Maier, in Munich, and M. Brauneck, in Mayence, two phototypists of high repute, use almost exclusively Coignet-gelatine.

Considering the above facts, we may in general lay down the following principles:—If the gelatine is to be used for those processes where the image—that is, the relief—is to be developed with hot water, especial stress is to be laid on the absorbing quality; but if it is to be employed for collographic printing, the resisting power should decide; and, further, of two equally resisting qualities, the less absorbing kind is to be preferred. The matt drying kinds are also better than those drying with a glossy aspect.

A further criterion which may yet be mentioned is, that a solution holding ten per cent. ought not to melt below 30° C. But the fear of gelatine containing alum is unfounded, as even ordinary kinds are quite free from it.

Technologically speaking, we distinguish two kinds of glue: (1) bone, or skin-glue; (2) cartilage glue. According as the gelatine is prepared from the one or other kind, the richer is it in "glutin" or "chondrin;" the cartilages containing principally chondrine, the bones, and the skin, glutin. With regard to adhesive qualities, the latter is greatly preferable, and for the reason that the glutinous brands are more serviceable for the making of carbon tissues, and the like, than the chondrinous ones. The latter also sooner gets insoluble.

Husnik, the well-known Austrian experimentalist, asserts that the waste of hides and sinews of older animals yield better gelatines for photographic plates than those of younger ones. Dr. Eder, however, holds the opinion that the chondrinous kinds are much better for this purpose, provided they be sufficiently resistant. According to this gentleman, chondrin imparts a greater brilliancy and more contrasts to the prints; and he further states that one of the first establishments in Germany (Strumper, in Hamburg) has given directions to his manufacturer to employ the (chondrinous) waste of calves'-heads in the making of gelatine. Isinglass, according to Maier, imparts also more brilliancy to the prints. However, there exist at present contradictory opinions on this point.

The "Topic" for next week will be "Surveying by Photography," by Lieut. L. Darwin, R.E., Honorary Secretary of the Photographic Society.

Reviews.

The Principles and Practice of Photography Familiarly Explained. By Jabez Hughes. Twelfth Edition, Carefully Revised and Edited by J. Werge. (*London: Simpkin Marshall and Co., and J. Werge, Berners Street.*)

With the advent of summer, a new edition of this useful little book reaches us. To many of our readers, Mr. Hughes' familiar explanation of the art science is already well-known, and to those we may say that in this last impression they will find chapters on the subject of gelatine plates, and other matters of recent interest. Photographers, or intending photographers, who are unacquainted with the little handbook, will find a shilling well spent in its acquisition; if it does not furnish such full and elaborate information as some of our larger manuals, the explanations given are expressed simply and straightforwardly in a manner that all must understand.

Photography: Its Origin, Progress, and Practice. A Lecture Delivered by J. Werge. (*Same Publishers*).

Mr. Werge sends us a reprint of a lecture delivered before the Lewisham and Blackheath Scientific Association. There are few men more fitted for the task than Mr. Werge, who is known not only as a capable and indefatigable experimentalist in the world of photography, but as one possessing considerable knowledge of the history of his subject. In alluding to the great men connected with the early discoveries of our art, Mr. Werge rightly brings to the front a name that is too often omitted from the honourable roll, that of the Rev. J. B. Reade, who was the first to produce and show a *developed* photograph, using the term apart from that of Daguerreotype. Mr. Werge traces our art from "early glimmerings" of light-printing to the latest of our printing processes. By way of illustration, there are prints by the Woodburytype, Collotype, and Dallastype processes, the last example being from a negative of Mr. C. D. Davies, of Blackheath, a well-known amateur, who has cleverly taken an instantaneous picture of a duck with one of its white feathers in the act of blowing away.

La Photographie en Amerique. Par A'Liébert. (*Paris, Rue de Londres, 6.*)

M. Liebert sends us the third edition of his exhaustive work. It is certainly one of the most complete in the French language, and is profusely illustrated with woodcuts and photographic prints. Not only does the work treat of photographic operations and processes, but it contains much information on the subject of lighting and general arrangement and organization of the studio. The portion of the book relating to the latter is, indeed, particularly well written.

HOW TO REMOVE BROWN STAINS, AND REDUCE DENSITY IN GELATINE NEGATIVES.

BY A. J. JARMAN.

Sometimes it will so happen that a gelatine negative that has been developed with pyrogallic acid becomes very much stained all over of a deep yellow or brown tint, which scarcely can be removed. I have found a means that removes this most effectually, and produces a brilliant clear negative, and at the same time has, as far as my experience has gone, none of the drawbacks that diluted hydrochloric acid have, although chemically it is a compound of chlorine, hydrochloric acid, and sulphate of sodium.

I take as follows:—

Common table salt	1 ounce
Common tap-water	8 ounces

Place in a small dish, when the salt has all dissolved have ready two drachms by measure of sulphuric acid in an ounce of common tap water.

Place the stained negative in the salt solution, and when soaked for a minute, mix the salt solution with half an ounce of the diluted sulphuric acid, and return to the dish, flowing carefully all over the negative; very quickly the brown tint disappears; pour the solution on and off a few times, then wash the negative and dry. It will be noticed at the same time that the density of the negative becomes reduced, also if it is allowed to remain in the solution for a short time.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

The Exhibition of the Society for 1880 will be held at the Gallery of the Society of Painters in Water Colours, 5a, Pall Mall East, London, S.W. It will be inaugurated by a Conversazione, open to members and their friends, at 8 p.m., on Saturday evening, the 2nd of October. The Exhibition will remain open daily (Sundays excepted), from Monday, the 4th of October, until Saturday, the 13th of November. Admission (from 10 a.m. till dusk), one shilling. It will also be open every Monday and Saturday evening. Admission (from 7 till 10 p.m.), sixpence. Members will be supplied with tickets to admit their friends.

All packing cases must be sent (carriage paid), addressed to the "Photographic Society of Great Britain," care of Mr. James Bourlet, 17, Nassau Street, Middlesex Hospital, London, so as to arrive not later than Friday, September 24th. Pictures by hand will be received at the Gallery, 5A, Pall Mall East, on Friday, September 24th, until 9 p.m. No packing cases can be received at the Gallery. Each exhibitor must send a letter of advice (containing a description of each picture, as also a statement of process, and any further detail to be inserted in the Catalogue) addressed to the "Hon. Secretary," Photographic Society of Great Britain, 5A, Pall Mall East, London, S.W. Each frame or picture may have the Exhibitor's name and subject neatly inscribed, but no address, or anything in the shape of an advertisement, will be permitted. No pictures in Oxford frames, and no pictures previously exhibited in London, will be admitted. Photographs coloured by scientific or mechanical means will be admissible. Photographs coloured by hand will not be admitted. Photographic apparatus and appliances may be sent for exhibition. Negatives and transparencies will be admissible.

The Hanging Committee will have the power of rejecting any pictures or apparatus forwarded.

Notice will be sent to exhibitors when to fetch away those works which are left at the Gallery by hand.

It is proposed to lay on the table a Catalogue containing the price of pictures to be disposed of; those who wish to avail themselves of this proposal will please state the price of their pictures in the letter of advice.

Medals will be placed at the disposal of the Judges for artistic or scientific excellence. The Judges will consist of the following gentlemen:—Two Artists (Painters)—H. Stacey Marks, R.A., H. Moore; the President of the Society—James Glaisher, F.R.S., &c.; two Members of the Council—Captain Abney, R.E., F.R.S., H. Baden Pritchard, F.C.S.; two Members of the Society—Frank M. Good, J. Gale.

No charge will be made to members of the Society for exhibiting their pictures; but to non-members, a charge of one shilling per square foot will be made for wall space; the minimum charge being five shillings. Foreign photographers will, for the occasion, be considered honorary members. The charge for wall space to those exhibitors who may become members of the Society at the November meeting will be remitted.

L. DARWIN,
Lieut. R.E., Hon. Sec.
Brompton Barracks, Chatham.

Correspondence.

GELATINE FAILURES.

Dear Sir,—I herein send you one of our failures in working dry plates, believing a record of failures to be valuable, serving as a beacon light to warn others. A short time ago we took a group of some seven persons, on the Saturday; on the Monday the assistant called my attention to the plate, which was hopelessly ruined by a number of "stars." He asked my opinion, but never having seen the like before I could not say what was the cause, unless it was that the plate had not been in the alum bath long enough. A few days ago we went out together to take a view; we took two cameras, so as to have two sizes; we each developed our own, both being in the developing room together. He, having finished first, held his plate poised on the tips of his fingers and thumb, and washed under the tap; in about a minute he called my attention to his plate. "See here," says he, "it is rising into blisters;" and sure enough, there were five "balloons" on the plate. It is needless to say that the plate was ruined, and when dry there were five stars. The mystery was out: the gelatine had softened by the warmth of his fingers, causing the film to blister.

From what I have seen of frilling I have come to the conclusion that frilling may be caused by incautious handling of the plate by people who have hot hands. I have noticed the film begin to frill at the sides when holding the plates by the edges.—I remain, respectfully yours,

W. Sykes.

THE OXYHYDROGEN LIGHT.

My Dear Sir,—I have read with much interest, in the pages of the News, the papers of Mr. Dallmeyer and the Rev. F. Hardwich upon the optical lantern and the lime light.

I hoped that the discussion on the best form of lime light for the lantern might have been further taken up, as I am sure it is not yet exhausted.

While tendering my best thanks to the Rev. F. Hardwich for his efforts to make the lantern more useful, I must confess I should like to know a little more of his reasons for such a strong predilection for the "mixed" jet over the form known as the "blow through."

It appears that he usually gets a picture from nine to ten feet in diameter. Now, as far as my experience goes, extending over the past twelve years, and that in many large lecture halls, I should expect to get a very brilliant picture with a "blow through" jet and a dense slide. Up to that size, 112 lbs. on the gas bag, I have seen on several occasions in Northampton a friend exhibit very dense slides up to 12 feet, very bright, with a very simple form of safety jet, and a very small consumption of gas—not more than 2½ feet per hour.

I can quite understand that for the Rev. F. Hardwich the "mixed" jet may be on the whole the best, but for a large number of others it is an important point to decide on the best form of safety jet.

Would Mr. Newton oblige your readers by giving his reasons for preferring the form of jet recommended by him a month ago, in which the oxygen passes over the hydrogen flame. He would confer a favour on me by so doing, and I am sure on many others interested in this matter.—I remain yours, very truly,

W. W. T.

RECEPTION ROOM DUTIES.

Sir,—In your last "Topic" A Lady gives us her ideas of the duties of a reception room attendant. This is an important subject, and the article was doubtless read with especial interest by hundreds of your lady subscribers, and I think it just possible that the experiences of others may have still further interest; with this belief I venture to trouble you with an account of the "day's doings" in the reception room of a country photographer.

The business in which I am employed may fairly be called a first-class one, where everything is carried on quietly, and in which photography is treated as a profession. I read with horror in the News a fortnight ago a short paper by a photographer who incidentally mentions that he took 100 sitters after one o'clock on a Saturday. We do not attempt anything of this kind; we don't rush our sitters through the studio like a flock of sheep through a hedge, but we are quite satisfied if we have half a dozen sitters in a day. We can attend to so many, and treat them fairly; the result is that our orders are so large that it takes two of us to receive the sitters and turn out the work.

The following is our ordinary routine. The business is opened at half past eight o'clock, and while my young lady assistant dusts the reception room, I name and enter into a book kept for the purpose the negatives taken and varnished the previous day. The printer then brings the prints, which have been washing all night, for me to dry. I sort and look them over; he then comes again for me to make my usual complaints and receive instructions; I then pass the prints over to my assistant to cut and mount.

I have all the proof negatives under my care until the orders are given. I enter and number each negative ordered from, with a print, into a catalogue, much valuable time being often otherwise lost in not knowing which position is wanted; when an order comes in you can turn to your catalogue, and find at once the one you require. My next duty is to send to the printer the negatives from which orders are required to be printed.

Next I retouch the negatives taken on the previous day already referred to, and take care not to give them the best "ivory" polish. I simply soften the hard lines of the face, but do not take all modelling out, and so destroy the true likeness. I receive all the sitters and visitors who come to "look round, and kill time." After the prints are quite dry and rolled, my assistant and I spot and touch them up. We have very few prepayments, and this entails keeping several account books. When the orders are finished, I pack, and send home late in the afternoon, as I am not so likely to be interrupted.

It is best to be always cheerful and willing to please customers, letting them see you don't mind taking trouble. This is sometimes hard to do, especially when you have just got your orders ready to send out late in the afternoon, and a lady of uncertain age comes in to give you her mind, and keeps you half-an-hour pointing out "little" improvements, such as taking off a little of the ear, nose, and mouth, to make her look less angular.

It is a very important thing to know your price list well, also the prices of colouring, &c., so as to give a ready answer, and to let enquirers know you quite understand your business. It always looks well to keep your room tidy, and this is sometimes difficult, as things get disarranged when you have been showing various specimens, and children pulling pictures about.

Finally, we try to conform to the golden rule, "Let the day's work be done in the day, leave nothing for the morrow." The morrow provides its own work. A. D.

GELATINE PICTURES.

Dear Sir,—The testimony given in your columns of last week from Mr. H. P. Robinson, to the effect that his recent experience of gelatine plates convinced him that certain results are in advance, instead of being behind, collodion, is one that will be generally corroborated. Until this summer, owing to very bad weather, scarcely any real opportunity has been afforded for tests of undoubted accuracy.

I say from experience, daily increased, that such photographs of horses, and other quadrupeds, or such perfection of large groups, schools, or wedding parties, &c., as are taken on gelatine plates was utterly unknown in collodion times, except under the most exceptional circumstances. On looking back over an experience in photography of many years, I may say I never witnessed such an advance in the same time as has occurred in gelatine plates.

With perfect truth it may be said that the objections are practically removed and the appearance of a gelatine negative is indistinguishable from a collodion, except in one respect, that not more than five per cent. of photographers ever found plates so smooth, clean, and free from blemishes as are the dry ones. The expense is less, for much less labour is required, and each person can do much more. Many more sitters can be taken, more positions, the same also with views, instead of a whole day being required for a sit, it is but a very brief portion of one.—Faithfully yours, Samuel Fry.

OXALATE DEVELOPMENT.

Sir,—I see one of your correspondents, "Anxious," has been troubled with spots in gelatine negatives. I myself suffered from the same on first using Dr. Eder's oxalate developer, but on filtering the oxalate solution the spots entirely disappeared.—Yours, &c., A Beginner.

ASSISTANTS.

Sir,—As "Beau Nash" remarks, this question gets tired, and seemingly to little purpose—seemingly, though I fancy it has some effect, if only to stimulate the younger assistants to strive for some of the plums—ten pounders, I mean; and further, I don't think any old hand will deny that assistants are better paid now than ever, have more constant employment, and that, on the whole, a better class of men are engaged in the business; but we cannot all be top sawyers.

Now I have been a photographer nearly all my life, and never had much cause to grumble at my pay. I have not as yet managed to reach £5 5s. per week. I once had four, and now have three. I have worked for fifty shillings, and even lately for forty shillings per week. If I want a situation, I take what offers, and at the same time look out to improve myself.

"Beau Nash's" advice is what the malcontents should follow. What is there to learn in photography that is not open? There are schools of art and works of art for free study, there are works in legion on chemistry and photography; the rest is hard work. You get good lenses, chemicals, &c., and any amount of formulæ how to mix and use them.

Considering their rank in the social and educational aspect, photographers one and all are better paid than other tradesmen; such is the opinion of yours, One of Many.

THE GELATINO-BROMIDE PELLICLE.

Sir,—My attention has just been drawn to a letter of Mr. Burgess in your last issue, wherein he states Messrs. Wratten and Wainwright indirectly obtained their information how to wash their emulsion from him. This statement, of course, is no concern of mine, but what follows certainly does apply to myself, as he boldly claims the invention of the gelatine pellicle as his own, and states that he told me the best way to keep the emulsion was to dry it, and that he had actually shown me a quantity partially dried.

All that I need say is, this, that it is purely imaginary. If he knew, as he pretends, the best way to keep the emulsion was to dry it, why did he not do it himself, and not send it out in the emulsion state, and in which he acknowledges he knew it would not keep? Again, how comes it he has taken nearly seven years to make up his mind to this statement? I wonder he did not let his imagination carry him a little further, and fancy he had also informed me how to make the emulsion before drying it.

I suppose it's so long ago that he has forgotten when he came to me, and begged that I would not make my formula known (as I had promised to do), as, if I did, it would be greatly to his disadvantage.

I am really sorry to learn he has not been so fortunate with the process as I had imagined. If, however, this letter is merely a flourish of trumpets to a new issue of plates, I wish him better fortune in his new venture.

I am much obliged for his kind wishes in my having benefited by the process more than he has, and beg to assure him that I am amply rewarded for my tenacity in sticking to the process through good and evil report for the past seven years, to know that from my doing so, the gelatine process has now got such a hold that nothing on earth will ever shake it off again. R. Kennett.

Talk in the Studio.

Messrs. Watson and Son, of High Holborn, have favoured us with a new edition of their catalogue, which now seems to contain every article, from a camera to a clip, that may be useful to photographers. We are glad to see that the list has been properly classified, so that little time is lost in looking through it. Messrs. Watson and Son supply gelatine plates, and are fortunate in being the agents for those of Mr. C. Bennett.

Messrs. W. and D. Downey.—We learn that His Majesty the King of the Hellenes, and Her Royal Highness the Princess of Wales, attended by Miss Knollys, honored the new studio of Messrs. Downey with a visit on Monday morning last.

Messrs. Sawyer and Son, of Newcastle and London, send us a series of panel portraits of high merit, both as regards their art and photographic qualities. The tone of the pictures is a rich brown that gives both colour and warmth to the studies, and represents the perfection of photographic printing. One of the studies, "Rags and Bones," a guant old ragpicker with grizzled beard, who has something of a bird of prey look about him, is evidently in luck's way, having secured something to his liking; the picture contrasting forcibly with another, "Good Morning," the model here being a charming young lady pulling aside a heavy damask curtain to greet you.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

Employers who Know Nothing of the Business.—We have received several letters on this subject and on the correspondence it called forth. Mr. J. Streatfield Cox says:—"I read the article and thought well of it, failing to see how it could be construed into other but general satire." Mr. Cox further thinks that considering Mr. Bradforde puts his name to everything he writes, that "X," if he has any complaint to make, should not omit to do the same. "Does 'X' really know nothing about the business? Happy thought! If you can, sir, find out all about him—the certain city with its principal street—is first-class business—and, at your earliest convenience, let us have in the News the following:—The 'At Home' for next week will be, "Mr. 'X,' of the Principal Street in a Certain City." A Bath Photographer thinks it a great pity that people should enter into a business they have no knowledge of. He has two assistants who have been with him over ten years, but can well understand how under the circumstances Mr. Bradforde relates that employer and employee do not get on well together. He has little sympathy with "X," who would appear on his own showing to be a lavish philanthropist, but who probably omits to tell all in connection with his relations with his assistants. "Ten per Cent." writes to suggest that where "employers know nothing of the business, the assistant or manager should be paid a small retaining fee, and recoup himself mainly by a percentage on the takings."

Devonian.—If you will look under this heading in last week's News, you will see the manner of constructing Mr. England's bamboo stand described.

A Beginner.—The optician tells you the distance between object and lens as a guide for getting good work from his lens. A carte-de-visite lens will give you a bust, three-quarter, or standing portrait; but if you strain it unduly—or, in other words, make a lens of small diameter do the work of a larger—the curvature of the field will be very visible, causing indistinctness, defects which are explained by the fact that the lens employed is too short in focus. If you approach very close to the sitter, and take a large head with your carte lens, you will soon find out its limits.

D. Whyte.—We find he has gone abroad; if you wish us to see him when he returns, in perhaps a month or five weeks, we will do so.

G. T.—You must remove the hyposulphite and all trace of alkali before you begin; hence the protracted washing.

H. E.—You must stop your development sooner—or, rather, not let it go on so fast. Whether you employ pyrogallic or oxalate developer, you may use bromide solution as a restrainer; you can then keep development better under control. Distance is sure to fog before foreground.

A. B. C.—To make Edwards' developer, prepare two stock solutions—

No. 1.—Pyrogallic acid	...	1 ounce
Glycerine	...	1 ,,
Methylated alcohol	...	6 ounces

Mix the glycerine and alcohol, and add the acid.

No. 2.—Bromide of potassium or ammonium		60 grains
Liquor ammonia ·880	...	1 ounce
Glycerine	...	1 ,,
Water	...	6 ounces

Add one part of No. 1 to fifteen parts of water; in another bottle put one ounce of No. 2 with fifteen ounces of water; use in equal proportions. For further details see News of April 9. Notman, of Montreal, whose snow pictures were so successful, employed the soft under-down of a Canadian duck; you ought to be able to get something better than swan's-down. Salt would scarcely answer.

J. W. Sykes.—It was published in June, 1878, but we hope to give you further information on the subject next week,.

Leo.—Put your burner under your exit tube, after it issues from the cupboard, and where it is narrowest. This will give a better draught; during summer weather you hardly require to raise the temperature.

A Constant Reader.—Take:—

Sandarac	...	½ ounce
Canada balsam	...	1 drachm
Sulphuric ether	...	7 ounces
Benzole	...	3 ,,

See an article in our Year-Book of 1873 on the subject.

Anxious.—1. Not at all injurious. 2. Ten times as much water as bromide, evidently; say one drachm of bromide to ten of water. A dozen remedies have been suggested; one we have found to answer *occasionally*, is to employ the hyposulphite solution lukewarm.

Scotty in Yorkshire.—We have perused your good-natured letter, but we think you need little advice from us. There is certainly no necessity in your case for an oxy-hydrogen flame; you will find quite enough illumination from a single or double burner if well constructed. By the way, Browning, 63, Strand, we see, has now a triple burner. A double one, in our experience, gives quite enough light for even a large room. We cannot add much to the description to which you refer. You know, as well as we do, that to give full brilliancy, particular attention must be paid to draught, while the shape of your instrument will depend much upon the number of your burners.

Fido.—We presume you mean to produce enlargements by development. You may treat good Saxo paper by floating upon the following:—

Albumen	...	2 ounces
Iodide of potassium	...	100 grains
Bromide of potassium	...	100 ,,
Water	...	1 pint

Paper so prepared will keep any length of time; to sensitise, float upon—

Nitrate of silver	...	420 grains
Acetic acid	...	420 ,,
Distilled water	...	1 pint

After drying in the dark, expose in the solar camera for a couple of minutes. Then develop image in—

Distilled water	...	1 pint
Pyrogallic acid	...	20 grains
Citric acid	...	40 ,,

Wash and fix, and tone in hyposulphite solution containing a little gold. See also News for Feb. 27th.

J. Cowell.—We have no faith in the use of alum, and it is rarely employed; it would toughen the film, and might be used before final washing. 2. The most systematic forms of washing, to our knowledge, are those used by Mr. Bedford and Mr. England, of which an account will be found in our "At Home" of April 23 and April 9. We can hardly summarize the points in Mr. Wane's paper for you, but our publishers will send you the paper for four stamps if you order that of March 19. 3. We do not think washing all night injurious if proper care is taken.

E. R. T.—Enlargements are not generally done on salted paper, but you may try the following formula:—

Chloride of gold	...	1 dram
Chloride of ammonia	...	2 drams
Water	...	20 ounces

When dry, excite on 60-grain ammonia nitrate bath, made as follows:—1,200 grains of nitrate of silver dissolved in 15 ounces of water, converted into ammonia nitrate by careful addition of strong ammonia, until precipitate formed is just redissolved; then make up to 20 ounces with water. Float for two to three minutes. Fix in—

Hyposulphite	...	5 ounces
Water	...	20 ,,
Iodide of silver	...	14 grains

When dissolved, add 1 ounce of a 60-grain solution of ammonia nitrate, proof to be immersed without washing, to remain one hour; then put into several changes of boiling water, and finish off with cold. In 1873 Year-Book there is a very good process for enlarging on canvas.

H. H. Harding.—Please send address; we have a letter for you.

PATENTS.

COMPILED BY MR. DES VŒUX,
Patent, Trade Marks, and Photographic Copyright Office, 32, Southampton Buildings, Chancery Lane, London.

No. 2162. Edwin Ambrose Brydges, of Berlin, Germany, "Improvements in the Preparation or Production of Photographic Emulsion." A communication to him from abroad, by Professor Doctor Hermann Wilhelm Vogel, of the City of Berlin aforesaid. Dated 27th of May, 1880.

No. 2249. Boleslas de Dutkiewicz, and Anatole Edward Decoufle, both of Paris, France, "An Improved Process of Painting on Cloth, Photographs, Engravings, and Prints." Dated 2nd June, 1880.

No. 2304. William Phillips Thompson, of Liverpool, "Improvements in and relating to Copying Plans, Drawings, Documents, and other Pictures, or like objects composed of black-and-white (or their equivalent photographically) by photographic means, and in compositions therefor." A communication to him from abroad by Mons. Adolph Toltrain, of Paris, in the Republic of France. Dated 8th June, 1880.

The Photographic News, July 2, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Difficulties in Photo-Surveying—The Awards of the Sydney Exhibition—A Fresh-Water Medusa.

Difficulties in Photo-Surveying.—In a communication to our pages, Lieutenant Darwin makes known some of the difficulties attendant on surveying with the aid of the camera. The advantage claimed for the employment of photography in this connection is, above all, expedition, and, on the face of it, there certainly seems no reason why the collodion or gelatine plate could not record observations more quickly and truthfully than the eye. In theory it is hard to see where any hitch can be. The far-seeing lens with its sharp and accurate observations should surely be able to appreciate all that the eye can discern, while the sensitive film is only too ready to record anything that may happen in its field of vision. But when we come to practically employ the camera, we do not find the matter so easy. In the first place, we are given a station, and directed to take (say) certain views in different directions. The first negative succeeds; the atmosphere is clear, we can see the far hills in the distance, and the light shines exactly as it should shine in order to secure sharp detail and definition. The rays of light strike the heights in front, at an angle of something like 45°, and under these circumstances we are able to secure a perfect picture. But now we have to proceed with No. 2 view, and it is required to alter the direction of the camera. If the object to be photographed were bold and near at hand, it would not, perhaps, so much matter; but it is distance to which we have to give our attention, and delicate distance requires to be very well lighted. When developed we get a flat picture, with an objectionable haze, through which everything is seen but indistinctly; or, may be, if we are not careful, we only get foreground and no distance at all. It is true there is a remedy for this. We may wait between the taking of the views, in order to let the light get round; but then we lose valuable time, and the main advantage we were to secure in using the camera has gone. Again, landmarks which are very visible with the light shining in one direction may be almost invisible in a second photograph. Landscape photographers all know what a difference the angle of lighting has upon the appearance and shape of an object, and even its height is sometimes apparently altered; and when we remember that it is the accurate rendering of certain objects in the camera upon which the photographic surveyor depends, the importance of this matter will at once be seen. Another point, not less important, that Lieut. Darwin mentions, is the choice of a lens for the purpose. As he says, the best lens, of course, is one of long focus. A long focus lens is the only one that will do justice to the landmarks you have chosen, and render these upon the photograph in a clear and intelligible manner. But the use of a long focus lens involves difficulties. In the first place, you must take a large number of views to complete the panorama. No less than ten would be required, and as three fixed points are necessary in each picture, the work of triangulation would be considerable. Thirty fixed points would in this case be necessary, and we quite agree with Lieut. Darwin, when he says that to get fifteen clearly visible stations is quite difficult enough. Therefore the photo-surveyor abandons the long focus lens, and chooses one embracing a wider angle. Employing this instrument, he can manage to complete the panorama in five views, requiring for the work fifteen stations; but how unsatisfactory photographs taken in this way must be for surveying purposes is obvious to all. The Chevalier plane table, to which Lieut. Darwin incidentally refers, is, perhaps, the most perfect photo-surveying instrument that has yet been devised. It is a misfortune that the instrument was barely completed before the death of its inventor, for M. Chevalier might possibly have given us a more practical instrument. It is one that has been employed both in this country and abroad, but the very limited use made of it shows that there is something wanted to bring it into everyday use. M. Chevalier was considerably encouraged in his work by the late Emperor of the French, and at the time of the inventor's death he was engaged in making a modification of the photographic plane-table to render it applicable for siege-work, so that by its means the fire of a battery might be directed with the same certainty at night as by day.

The Awards of the Sydney Exhibition.—The awards of the Sydney Exhibition have been made. There were four classes of awards, it seems, and all four have been conferred. Colonel Stuart Wortley is fortunate in receiving the honour of the first class, his well-known masterly views of sea and sky no doubt having secured it him. The Colonel, we believe, is attending the Exhibition in an official capacity as a delegate from South Kensington, and it will be doubly gratifying to him, therefore, to be on the spot to receive the award personally. We congratulate, too, Messrs. Marion and Co., who have had the good fortune to secure an honour of the same degree. In the second class, Mr. H. P. Robinson, of Tunbridge Wells, and Mr. R. Slingsby, of Lincoln, receive recognition, and from this fact we must either suppose that pictorial and portrait photography at the Antipodes is far in advance of the art in England, or that by some mischance our masters at home failed to be appreciated. Mr. York's name we are always glad to welcome, and if it is his transparencies that have gained the award, we know that he well deserves it. Mr. Frith's views gain him also an award of the second class, and Mr. Weiller secures a similar honour. Mr. A. L. Henderson, who is well known to be *facile princeps* in the matter of enamel photography, does not receive more than a second class award either, but he may console himself by the fact that he is in very good company. We have never seen any photographic enamels from Australia, but since Mr. Henderson's are only considered worthy of a second class award, we anxiously look forward now to the fine work of our far-off brethren. Mr. Hedges receives a third award, presumably for his clever cattle studies; and Mr. E. Debenham is put in the same class. Mr. H. Manfield, of Northampton, receives an award of the fourth degree.

A Fresh-Water Medusa.—Considerable excitement has prevailed among naturalists during the past month owing to the discovery of a new animal in the ponds of the Botanical Gardens. The Secretary of the Society appears to have found what turns out to be a sort of fresh water jelly fish, and very impartially sent specimens of it round to various gentlemen whom he believed would take an interest in the discovery. The result has been a series of high pressure investigations and papers, each savan vieing to be before the other to give attention to the little animal. One investigator worked both night and day, and so was enabled to beat his brethren by several hours, furnishing the animal with a name, and thus adding a finishing stroke to his work. But a cry of "not fair" appears to have been raised by others in the race, and the fresh water Medusa will most likely be re-christened. In the meantime one naturally asks, what has become of the original discoverer in all these efforts to connect one's name with the new-found jelly-fish? What squabblers naturalists are, to be sure! Photographers never make such a fuss when they get hold of a fresh-water Medusa?

Messrs. Hyatt and Hyatt, of Portsmouth, send us a little carte almanac, an example of enamelling quite equal to that of the Paris houses which make the *carte emaillee* a speciality.

At Home.

M. LIEBERT IN THE RUE DE LONDRES.

Not very far from the Ouest railway station, with which passengers coming from England by the Newhaven and Dieppe route first become acquainted on their arrival in the French capital, is the new studio of M. Liébert. The establishment is noteworthy in this respect, that it has been built expressly for photography, and with a view to meet the requirements of the art and its votaries. For some reason, which we were not clever enough to discover, M. Liébert calls his studio by the name of "Photographie Américaine," for whether it is like an American photographic establishment or not, we are unable to say. It is a lofty building in the Rue de Londres—M. Liébert has a formidable rival near in the person of M. Walery—and from cellar to basement it is taken up with photographic requirements. Downstairs, in the back portion of the house, the toning, fixing, and washing of prints are carried on, operations that are thus conducted with little change of temperature; while in front are situated the engine and electric machine that supply M. Liebert with illumination at night. The engine is one of the Otto gas engines, which bid fair to supersede boiler and steam engine altogether in cases where limited power only is required, and this in a dwelling-house or populous locality. There is no need to light a fire an hour previously, for the purpose of getting up steam, nor of enlisting into your service a trained engineer learned on the subject of pressure gauges and boiler fluids. When you want to begin work, you simply turn on the gas, light a single jet, give one of the wheels a swing round, and the engine is started. The consumption of gas in an engine of about one-horse power is said to be about threepence per hour. M. Liébert has a Gramme machine for grinding out his electricity, and this is then conducted above to the first floor, where the electric light studios are situated.

We now ascend to the ground floor. Here are the mounting room—M. Liébert employs starch mixed with a little gelatine for mounting—the lobby, and entrance hall. The visitor walks upstairs to the first floor, the passage and staircase windows tastefully set with photographic transparencies, produced upon carbon tissue. We now reach the bureau, and right and left are two handsome salons filled with pictures of every kind and description. M. Liébert, besides being an author of some note—his Photographie en Amérique being a most trustworthy handbook—is a thoroughly business man, and marches with the times. Portraits are taken day and night, and there is a wide choice before the customer as to the mode of finishing. The other evening, M. Maurel and a party of brother and sister artistes visited the studio in costume after their performance at the Grand Opera, to be pourtrayed by the electric light, and thus saved the trouble of making a morning appointment. If ladies and gentlemen tire of looking at pictures, there are other amusements open to them in the establishment. M. Liébert provides a "Salle de Billiard" and a "Terrasse d'agrément" for the convenience of his clients while waiting, and no doubt if they asked to be accommodated with a croquet green, or with a lawn-tennis ground, M. Liébert would have sufficient enterprize to provide these too. Indeed, for a "Photographie Américaine" to be without an American bowling alley is already a glaring defect, we beg to point out. Only, the great difficulty in providing luxuries—as, no doubt, M. Liébert has found out by this time—is to know where to stop; however this may be, our host draws a hard and fast line at billiards just now.

Enamelled portraits, or *cartes emaillées*, are here very much in vogue, and so is the new panel portrait, a pair of which M. Liébert presents us with, taken by electric light. He has two electric-light studios leading out of the salons, the one for vignettes, and the other for plain portraits. The reflector, which is hoisted on high at one side of the sitter, is a huge basin of white paper measuring three or four feet in diameter, the electric light being thrown into this receptacle by a little saucer-shaped reflector placed against the electric spark. The rays are thus thrown into the interior of the large white reflector, to be cast back again upon the sitter. M. Liébert can get a good panel picture with the electric light in five seconds if he uses a gelatine plate, but an exposure of not less than forty seconds is necessary in the case of wet collodion. The pictures M. Liébert was good enough to give us we have very carefully examined, and they are certainly little inferior to results obtained by daylight.

Before proceeding upstairs, we secure a card of terms at the bureau. The *carte emaillée* is so much a matter of course here that it occupies a very prominent position in the list of prices at M. Liébert's establishment.

Cartes, per dozen,	20 francs,	or Enamelled,	35	francs.
Cabinets, ,,	40 ,,	,,	65	,,
Cartes, per hund.,	100 ,,	,,	220	,,
Cabinets, ,,	225 ,,	,,	425	,,

The panel portrait is charged at the rate of a hundred francs the dozen, not enamelled.

It will be seen that a very considerable charge is made for enamelling—we will describe M. Liébert's *modus operandi* presently—and it is for this reason that the style of portrait is humoured by Parisian photographers. "As an artist," said M. Liébert to us, very frankly, "I dislike them much; as a man of business, I regard them as a very good thing. The public are enchanted with them; they like the high glaze and finish, for it flatters their vanity to make them appear like the superfine pictures we see on bonbon boxes, and I am not the man to stand in the way of my patrons."

There is little to remark in M. Liébert's studios; he has two, a large one fitted for the taking of ordinary portraits and a smaller one upon the roof, and, therefore, with plenty of light for the special treatment of children, and where shortness of exposure is the main desideratum. It was very hot during our visit to the studio, but, strange to say, in M. Liébert's studio the temperature was comparatively cool. And for this reason; by a clever contrivance water was permitted to run down the roof and sides of the studio, not in a torrent, but in a thin flowing and continuous stream, which had the effect of effectually cooling the atmosphere within. A sound roof is obviously necessary if such a system is made use of, but in the case of M. Liébert's studio not a drop of moisture found its way between the panes.

M. Liébert believes in plenty of room in his dark laboratory; for it is without exception the largest apartment of the kind we wot of, if we leave out of consideration the roomy laboratories of the Autotype Company at Ealing. Only those who are cramped all day long in close dark closets can appreciate to the full a spacious dark room, where the air is cool and there is plenty of it. It opens, too, into the cooler part of the glass room, as should be the case in well-constructed studios. Considering that assistants have often to remain for hours together coating and developing plates in the dark room, it is surely a wonder that so little attention is usually paid to its temperature and ventilation.

Since the production of glazed photographs, or *cartes emaillées*, still receives so much attention in Paris, we make no apology for referring once more in these columns to their production. The method of preparation recommended by M. Liébert is as follows:—Some plates of glass (patent plate) are carefully cleaned; they are either rubbed with a little powdered talc, or with wax dissolved in ether; but better still, the edges are straightway covered with fresh albumen solution laid on with a brush. After drying for a quarter of an hour or so, normal collodion

is applied, to which a few drops of hydrochloric acid have been added, the acid, however, being only used when neither wax nor talc has been applied to the glass. The plates thus coated are put carefully away to dry, while the prints are being prepared.

These prints are first dipped into warm gelatine. One hundred grammes of good gelatine are soaked in a litre of cold water for an hour, and then dissolved by the aid of a water-bath. The solution is filtered warm through a piece of muslin into a vessel standing on the water bath, and thus maintained at a warm temperature, in which condition the gelatine must remain during the whole process. A collodion plate is coated with some of this gelatine, and then one of the prints, which have been dipped into the warm solution also, is placed face downwa_rds upon the glass surface. (The carte or cabinet print, by the-bye, should have been trimmed first of all). Then a sheet of cardboard, previously dipped into warm water, is laid upon the print and pressed down by means of a thin piece of waterproofing, which has also been kept in warm water.

A stout strip of glass, such as used for squaring, is now energetically drawn to and fro across, with its angle against the waterproof, and in this way all air-bubbles are rapidly got rid of. The waterproof, after this thorough manipulation, is removed, the plate is put upon a stand, and allowed to dry in a highly heated chamber. At the end of this period the print is cut round with a sharp knife inside the border of albumen, and will then leave the glass of itself. It may be embossed in a press, or finished in its present condition.

Instead of thin cardboard, successive sheets of paper, all dipped into the warm gelatine, may be laid upon the print to mount it, a plan preferred by many. Finally, the *cartes emaillées* should have a fly-sheet of tissue paper attached to them to protect the surface as much as possible.

The "At Home" for next week will be "Mr. R. Slingsby at Lincoln."

INTENSIFICATION OF GELATINE PLATES BY SILVER.

BY CAPTAIN ABNEY, R.E., F.R.S.

In a paper read before the Photographic Society of Great Britain in March last, wherein I pointed out certain advantages connected with the introduction of iodide of silver into gelatine emulsions, I concluded with the remark that I had a method of giving intensity to gelatine negatives with silver which I sorely felt tempted to give, but which I thought I had better withhold for a time till I had more thoroughly tested its value. The time has, however, come to publish it, perhaps rather more quickly than I had intended, but it would be unfair to the readers of the Photographic News to hold my hand any longer; so I now describe the process for their benefit. Very many experiments convinced me that in order to intensify a gelatine negative after fixing with silver, without risk of staining it, was absolutely necessary to get rid of certain substances to be found in the film. The first that naturally suggested itself was the hyposulphite. It might be thought that by continued washing this might be eliminated entirely, and I am not prepared to say that it cannot be.

Some negatives, however, which I have washed for twenty-four hours, and to which I then applied pyrogallic and silver, showed the reddish stains which are so well known, and it behoved me to find out the reason of this. It would be wasting your readers' time if I recounted my experiments, but it is sufficient to say that I came to the conclusion that when a negative is developed by the alkaline method there is a certain dye left in the film which acts like dirt on glass plates in the wet collodion process, inducing the discolouration when coming in contact with silver nitrate. After trying to get rid of both hyposulphite and this dye by various means, I came to the conclusion that an oxidizing agent would be the most effective, and naturally turned to the simplest, which is peroxide of hydrogen, or hydroxyl, a substance at one time largely used by the fair sex to procure for them, by an application to a deeper shade, that golden hue of hair which was for a long time the rage; in other words, the dye was to be oxidized, and also the traces of hyposulphite, the latter being converted into sulphate. The application of this to the film was a complete success, and enabled any amount of local or general intensity to be given without any staining of the film. Peroxide of hydrogen is sold in solution by Hopkin and Williams at 4s. a lb, which contains ten volumes of the actinic body, or at 8s. a lb., when it contains 20 volumes: it is the latter I have used. To prepare a gelatine negative for intensification after fixing, the following plan should be adopted. Immerse it, after the fixing bath, in a fresh lot of hyposulphite for a short time, and then wash thoroughly for, say, half-an-hour, in frequent changes of water, to get rid of nearly all the hyposulphite. Next place the negative face upwards in—

Water	4 to 5 ounces
Peroxide of hydrogen ...	1 to 2 drachms

and allow it to remain five or ten minutes in this solution (longer will not hurt.) The plate must be again washed, and then any intensifier may be employed. The manipulations are most easily carried out in a dish, but this is not necessary when the film has not been allowed to dry before intensification takes place.

I have found that in this latter case the repellent action of the water is very easily eliminated by adding to the pyrogallic solution half its quantity of glycerine. The glycerine gives a "bite" to the intensifier, and enables local as well as general intensity to be given. I may say that I prefer the use of an iron-intensifier.

Ferrous sulphate	10 grains
Citric acid	20 „
Water	2 ounces

or any other slight modification which may be used in the ordinary wet process.

To make security doubly secure, when the proper intensity is given, I place the negative in salt and water after it is washed for a couple of minutes, and then pass through it the hyposulphite once more. This prevents the possibility of any silver remaining in combination with the gelatine, and subsequently darkening in the light. Another wash, and the process is complete.

I am perfectly aware that many will say they prefer the old mercury system of intensification; if so, let them stick to it. I certainly don't want to drive them away from it, though personally I won't use it for any negative I care about preserving. Experiments show that any mercurially intensified negative (intensified by whatever means) will gradually change in colour in the light, and that is one reason why I prefer the intensification to be given by silver. Again, I have always insisted that if photography is to take its proper position as an art, there must be a facility for giving local intensity to a negative, and with mercury you can't do it. My great objection to the gelatine process was that local intensity was difficult to manage, but I believe that the method indicated above will be found to have overruled that objection.

ON GELATINE FILMS AS A SUBSTITUTE FOR GLASS.

BY REV. H. J. PALMER, M.A.*

Since I last had the pleasure of laying before a meeting of this Association the results of my experiments with gelatine

* Read before the Liverpool Amateur Photographic Association.

films, certain minor difficulties have cropped up, for which I have endeavoured to provide a remedy. I am still working on in the hope that when the way has been made as smooth and easy as possible, the makers of commercial dry plates may be induced to adopt my process, and provide us with these portable sensitive sheets. I do not think that anything but a gelatine film can ever be successfully employed to support gelatine emulsion. The combination of gelatine and collodion, recommended some time since by M. Ferrier of Paris, does not answer at all in my hands, owing to the unequal expansion of the two substances; for this expansion of a gelatine sheet is inevitable as soon as water has touched it, although it may be controlled to some extent. Collodion also expands; but not nearly in the same degree as gelatine. And therefore, if the two films are superimposed, and wetted, the collodion will, if it is at all porous, split in every direction.

But there seems to me to be no necessity for complicating the matter by combining any substance at all with the gelatine; and the process I have published in papers read before this Society, before that of Edinburgh, and before the Photographic Society of France, in Paris, is so simple, and its defects are so easily to be remedied, that I had fondly hoped that long ere this we should have been able to purchase our gross of films for a lengthy excursion at home or abroad, with the pleasure and comfort of carrying the whole package in the coat pocket, and thus to defy both the douanier and the railway porter; for I confess that with regard to these films, and their failure to win favour among the workers of the gelatine process, I have felt somewhat like the self-congratulating parent of a child which he fondly imagines to be a wonderfully fine infant; and is filled with disgust and chagrin when he sees that, somehow or another, no one else seems in the least to appreciate, or pay any notice whatever to, the infant prodigy he has parented.

The process, as already published by me, consisted of the application of a thirty-grain solution of gelatine, with two drachms per ounces of oxgall, to a levelled glass plate. After thorough drying, this film was sensitized in the usual way with any gelatino-bromide emulsion, and when desiccation is once more complete, the whole is easily stripped from the glass, and is ready for exposure in the camera. I have demonstrated before your here the success of this process; and film negatives taken by it were developed in your presence. Two difficulties, however, have since somewhat damped the ardour of my enthusiasm on behalf of these films. In the first place, the catalytic oxgall was apt to have the effect not only of liberating the film from the glass, but also of setting free in patches the sensitive film it supported. In other words, I met with, occasionally, incurable blisters, which hopelessly ruined in other respects very perfect negatives. Another difficulty lay in the fact that the gelatine *plus* oxgall seemed to possess such a repugnance for its sensitized neighbour that it was a matter occasionally of considerable difficulty, and sometimes of impossibility, to get the emulsion to flow evenly over the supporting surface. Thick and thin patches would occur here and there, and the resulting negatives were mottled with insensitive or feeble portions of their surface. I have now overcome both these difficulties by exceedingly simple expedients, and will proceed to prepare a film before you by this improved and perfected process.

I have here a thirty-grain solution of gelatine, in four drachms of water, to which two drachms of ox-gall have been added, and two drachms of methylated spirit. I pour this over a clean glass, and, as you see, it flows with the ease of collodion. I drain somewhat closely, carefully noting that there are no bare spots on the glass, and then leave the plate to dry on a level surface. As soon as the drying (which is much assisted by the alcohol) is accomplished, I pour on the surface of this thin film a thirty-grain solution of gelatine in six drachms of water, and two drachms of methylated spirit, giving three or four drachms to each quarter-plate. The plate is levelled, all bubbles are removed with the tip of the finger, by just simply dabbing the said tip gently down upon the bubbles, and drying is accomplished in a warm atmosphere where there is a current of air. I take this dried film, and apply to its surface a gelatine emulsion in which two drachms of spirit have been combined with six drachms of water per ounce. And now you will see that the emulsion flows well over the surface, and that the film is even and satisfactory. A minor annoyance in the making of these films sometimes occurs when the plain gelatine overflows from the plate. This may be readily prevented by passing the edge of the plate over any substance that is repellent of water. A piece of wax, or even the end of a candle, will answer the purpose well. In the manufacture of large quantities of these films, of the quarter-plate size, I would recommend that sheets of plate glass 14½ by 13½ be used to support the films. To prepare these large sizes occupies very little more time, and presents very little more difficulty, than does the manufacture of the quarter-plates, and the resulting sheets of sensitive gelatine can be cut into twelve parts with the point of a sharp penknife with the greatest ease. I have not attempted to expose in the camera sensitive gelatines of larger size than that I have been employing in my demonstration to-day. There does not appear to me to be any insuperable difficulties in the way of their manufacture or employment. The modes of exposure and development in the case of the quarter-plate is easy enough. The film is simply placed in the slide *in situ*, and a glass laid upon it. This is all that is necessary to be done to keep it taut for exposure.

The development and fixing are conducted in a dish, as usual, the film being manipulated and held by means of a soft and large camel's hair brush. I am sorry that the light prevents me from once more developing a film in your presence. Unfortunately, I am not in possession of the secret of the great recent discovery which is to enable us to conduct all these operations in the open air and daylight, and I must content myself with showing you these films which I have developed to-day in my dark room. Larger sizes would, of necessity, be fastened by their own adhesiveness on the application of slight moisture to the surface of a supporting glass plate, and thus exposed in the slide. Their mode of development would differ in no way from that of the small sheets in your hands.

FRENCH CORRESPONDENCE.

New Edition of Van Monckhoven's Work on Photography—Researches of M. Jamin on the Divisibility of the Electric Current, and on the Use of the Gas Engine for Producing it—Measuring the Length of Exposure when Instantaneous Shutters are Employed.

Van Monckhoven's Work on Photography.—Our talented colleague, Van Monckhoven, has just issued the seventh French edition of his general treatise on Photography. The skill and scientific knowledge displayed in this work are immense, but, besides, there is something almost marvellous in the incessant activity of its author. Not only has he always some literary work on hand, but he also continually devotes himself to research and investigations of the highest interest, and to the improvements of new processes so as to make them practically useful. Any little leisure he may have to spare is given up to his correspondence with his fellow-workers in all parts of the world. It seems scarcely possible that he can find the time, either mentally or physically, for the discharge of all these duties. My readers will, I have no doubt, agree with me, when they are able to examine this new edition, and to recognize the care and completeness with which it has been produced, and they will be prepared to admit with admiration the remarkable faculty for invention and work possessed by its author, one of the most indefatigable inquirers in pho-

tography at the present day. An analysis of this excellent book, however short it might be, would lead us too far; I will therefore confine myself to a brief summary of the last chapter, in which is thoroughly discussed the important subject of gelatino-bromide. One of the subdivisions of this chapter, in which are enumerated the various influences which tend to modify the conditions of gelatino-bromide emulsions, more especially deserves the attention of those who practise this process. In this short letter I cannot quote the whole of what the author says on this subject, but I may be allowed to indicate briefly the principal points on which he touches. These are (1) the influence of the state of concentration and the temperature of the solutions at the moment of mixing; (2) the effect of alcohol; (3) the effect produced by the relative proportions of alkaline, bromide, and silver nitrate; (4) the influence of the proportional quantity of gelatine; (5) that of the quality of the gelatine; (6) the influence of the relative proportions of silver bromide and gelatine; (7) the effect produced by the length of exposure; (8) that produced by long-continued washing. The way in which each of these questions is developed by the author is highly interesting; he compels the operator to go to the very foundation of his work, and thus raises him above all empiricism, an abundant source of error in photography. It would be impossible for me in the small space at my disposal to give any further account of this valuable treatise. I can only strongly recommend all those who are interested in the gelatino-bromide process, and all those who wish to possess a complete manual of our art, to avail themselves of the opportunity of studying the work for themselves. Nowhere else will they find so much informtion on the subject of photography condensed within the small space of the 430 pages of this seventh edition.

Divisibility of the Electric Current, and the Gas Engine as a Prime Mover.—M. Jamin, member of the Institute, has been demonstrating with complete success his experiments on the divisibility of the electric current to a numerous audience, who were filled with admiration at the results that he has obtained. By the arrangement which he has adopted a number of lamps may be lighted or extinguished without interfering with the other lamps fed by the same electric current. This is a discovery of very great importance, as it removes the great obstacle that has hitherto presented itself to the introduction into general use of electricity as an illuminating agent; and what makes it still more valuable to those—and they are many—who can apply the electric light to photographic purposes, is that they will be able to effect this at a comparatively small outlay. M. Jamin, namely, demonstrated to his hearers that a gas engine, burning a small quantity of gas, will produce sufficient motive force to work the electrical generator. It follows from this discovery that gas will maintain its position even if the use of the electric light became general; if, instead of giving light directly, it will produce motive force by its combustion with oxygen, and we shall be able to have in the same house, without adding much to our present expenses, illumination by gas, the electric light, and a prime mover which, when the electric light is not required, may be taken advantage of for many other purposes. Now if an arrangement of this kind be useful to any one it must be to the photographer, who according to circumstances requires to employ all these different manifestations of energy.

Estimating an Instantaneous Process.—I am still considering the best means of measuring the exposure with an instantaneous shutter. I have thought of a tuning-fork, whose time of vibration is known for this purpose, but I have generally fallen back again on the disc, with a hand moving centrically, and passing over the circumference in a second. An analogous method, I see, has been employed by Messrs. Warnerke and Cadett in their experiments with drop shutters. I have, however, read with considerabl interest in the numbers of the PHOTOGRAPHIC NEWS for the 28th June last a note by Dr. Gowers on the use of the tuning-fork. The method of measuring the length of the exposure, as he describes it, is certainly sufficiently approximate for all practical purposes, but it seems to me to be much more difficult to arrange properly, and not to give so good an account of the effective work as a dial plate, whose hand can be photographed while in motion. By this latter plan the result as registered by the light itself can be read off. It is not even necessary to make the commencement of motion of the shutter and that of the hand coincide; the latter moves continuously, and when the sensitive plate is developed the space passed over during the time of exposure can be easily seen. The larger the dial the greater is the velocity of the extremity of the hand; if, for example, the space which intervenes between two successive sixtieths of a second be five millimetres, one millimetre would mark 1-300th of a second. Thus by measuring the diameter of the dial plate, and subdividing the space which marks the 1-60th of a second, we are enabled to estimate a very high velocity of the falling shutter. Now, of all the shutters which can be used for instantaneous exposure, I certainly prefer that whose rapidity of movement can be regulated according to the length of the exposure required. Nothing in my opinion is worse than a shutter always moving with the same velocity, or in such a way as to give an unknown duration of exposure, or one different from that which may be required in any particular case. It is not only necessary to be able to measure exactly the length of the requisite exposure, when that is to be a very short one, but also to have, as a factor of this measurement, the relation which exists between the displacement in a horizontal or vertical direction of the moving object to be reproduced, and the distance over which it moves relatively to the lens. Evidently, if the object moves at the rate of one metre per second at a distance of ten metres from the lens, it will be necessary, in order to reproduce it properly, to use a much faster shutter than if with the same velocity of translation it were at a distance of forty metres from the lens. The angle of displacement diminishes in proportion as the object is more distant, and the shutter should have a proportionately less velocity. It will be seen, therefore, that the question is a sufficiently complex one, but still we may hope that no long time will elapse before it is solved. LEON VIDAL.

SYDNEY EXHIBITION.

THE following is from the official list of Awards:

Colonel Stuart Wortley and Messrs. Marion and Co. receive awards of the first degree.

Awards of the second degree are conferred on:—

F. Frith	Views
A. L. Henderson	Enamels
H. P. Robinson	Artistic Photographs
Robert Slingsby	do.
J. Weiler	do.
F. York	do.

Awards of the third degree are awarded to:—E. Debenham (Bournemouth) and D. Hedges (Lytham).

An award of the fourth degree to H. Manfield (Northampton).

PATENTS.

COMPILED BY MR. DES VŒUX,

Patent, Trade Marks, and Photographic Copyright Office, 32, Southampton Buildings, Chancery Lane, London.

No. 2538. ROBERT KNOTT, of Bolton, in the county of Lancaster, "Improvements in Apparatus to be used in the 'Emulsion' Processes of Photography." Dated 22nd June, 1880.

The Photographic News.

Vol. XXIV. No. 1139.—JULY 2, 1880.

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GELATINO-BROMIDE FOR POSITIVE PICTURES.

It was to be expected that advantage would be taken of the gelatine process to obtain positive as well as negative impressions, and we are glad to find that the new emulsion lends itself particularly well to this important branch of photography. Both on glass and on paper most satisfactory results are to be secured, and it is very certain that in a little while photographers will be making ample use of gelatino-bromide in the production of prints.

Most of us know that an ordinary gelatino-bromide film can be made to yield a transparency of an agreeable nature. Any of the commercial plates exposed for a minute, or even for a small fraction of that period, under a negative to the action of a gas jet, will develop a positive image that may be made use of either for the multiplication of negatives or as a positive impression. But, in the latter case, it is necessary to develop with oxalate, since the slight tint of brown inherent to the pyrogallic acid developer becomes unpleasantly prominent. Moreover, as you desire to control the tone and vigour of the image, it is as well to develop slowly, and the addition of bromide to the developing bath is therefore to be recommended. The most rapid way of securing glass positives by these means is to adopt the suggestion of Mr. Werge, and place behind the transparency, while still moist, a piece of white enamelled paper, which, on the film becoming dry, adheres very tenaciously. The enamelled paper, which is an old commercial commodity, imparts a most finished appearance to the picture, the tone of which is of a cold grey not at all displeasing. In this way a large number of copies may be produced with exceeding celerity, for as soon as the degree of sensitiveness has been approximately judged, there is no difficulty in employing any of the plates in the market. Instead of printing under a negative, an enlarged picture from a lantern may be thrown on the plate, the image, when developed in like manner, and backed up with the enamel paper, yielding an exceedingly good result.

Opal plates coated with gelatino-bromide are now also to be purchased, and these afford a quick way of producing good glass positives. The film upon the opal can be retouched with brush or crayon without difficulty, and may be worked up in the same way as are those produced by the collodion transfer or powder process. In this case, too, the picture, of course, may be directly printed from the negative, or produced by the aid of an enlarging apparatus. The advantage of employing an opal plate instead of plain glass is, that you can control the development better, since the image is upon the white basis upon which it will ultimately rest. The tone of the print may be objected to as rather cold, but there will be means found of modifying this when the impressions become more popular.

But more important than either of these plans of producing positive prints is that of employing prepared paper. Already manufacturers are turning their attention to this subject. Mr. Swan has succeeded in producing a paper that yields most delicate proofs by printing under a negative in gas-light for a few seconds; and we see that Messrs. Morgan and Co., of Greenwich (who, by the way, have apparently made good their claim to have discovered a new method of development), promise us shortly a paper by means of which fifty prints can be secured by five minutes' printing in gas-light. In the case of Mr. Swan's paper the printing is quite satisfactory; the tone is still cold, and has very much the appearance of a platinotype picture. There is plenty of detail and a good deal of transparency; the glaze upon the surface of the print may, if objected to, be removed by a moist sponge, but for small work it is scarcely objectionable.

We have assisted in the printing of Mr. Swan's paper, the development of which required from three to four minutes. As we have pointed out, the last operation must not be hurried, for the success of the picture depends so much upon its tone. There is no difficulty in the matter, however, and the work is conducted as easily as the development of a gelatine negative.

As to the permanence of such prints, we may well be sanguine. The fact that, unlike albumen, there is no sulphur in the gelatine to begin with, augurs well for the new pictures. The elimination of hyposulphite, supposing this to have been used for fixing, should be more easy than in the case of an albumen film, while we may take it for granted that, being an emulsion, the silver particles are more protected from the atmosphere than in the case of an albumenized print, where the reduction is more particularly upon the surface. At the same time, in the absence of practical tests, we must speak with reserve, and we shall recur to the subject once more when we have sufficiently examined the film after a few crucial experiments.

HALATION OR BLURRING IN THE CASE OF GELATINE NEGATIVES.

The wet plate worker has not very much to fear from the effects of halation, unless, indeed, he happens to be engaged in photographing an interior—let us say the interior of a church— and is obliged to direct his camera toward a window which admits an amount of light altogether disproportionate to the obscure radiations from the somewhat sombre surroundings of that window. In such a case our "knight of the bath" has a very simple remedy in his hands—he merely lays a single thickness of red blotting-paper, previously moistened with water, on the back of his plate, and then proceeds to smooth this paper backing down, so as to ensure something like optical contact between the glass and the wet paper. He may now expose his plate long enough to secure full details of the darkest corners of the building, without any risk of seeing the windows surrounded by misplaced haloes of glory.

The gelatine plate worker is placed in quite a different position; not only is wet blotting-paper quite out of his line, but, if he had it ready to hand, he would seldom have convenience for opening his slides and applying it; while another circumstance renders his plates much more liable to halation, or blurring, than those of the wet-plate worker. The bath plates contain not only silver bromide, which is nearly colourless, and allows actinic rays to pass through with considerable freedom, but also the yellow silver iodide, which prevents the passage of any very large amount of actinic rays; while the sensitive gelatine film, being usually charged with bromide alone, offers so slight an obstacle to the passage of actinic radiation that a considerable quantity of light is reflected from the back of the plate, and acts on those portions of the film immediately surrounding the high lights of the subject. One of two methods may be employed to prevent this halation around the high lights: either the film itself may be stained with a non-actinic colour, or the back of the plate

may be covered with some kind of paint or backing calculated to absorb that light which passes through the sensitive film. The first, or staining method, may be generally considered as impracticable, as sensitiveness is thereby reduced; and other more positive evils often arise in consequence of this operation. It is therefore better to combat the evil effects of halation by backing the plates; and we recently made some comparative experiments on different methods of backing, and the use of various materials for this purpose. That method which consists in attaching a sheet of wet carbon tissue to the back of the plate is very effectual, but it is impracticable to the gelatine worker unless he squeegees the tissue on the plates before coating them with emulsion, as the free use of water during the operation of attaching the tissue would be likely to wet the film, and cause inconvenience.

A plaster composed of a piece of dark-coloured macintosh cloth thickly coated with india-rubber solution or paste may be employed instead of the tissue, optical contact being insured by a gentle friction with the fingers. In either of these cases the results are very satisfactory as regards the freedom of the plate from blurring, and the tissue or the india-rubber cloth can be readily removed before development by raising one corner with a pen-knife and gently pulling the raised portion. The above-mentioned methods of backing are not, however, very extensively adopted by gelatine workers; those who do back their plates being usually content with smearing the backs with a kind of paint made of burnt sienna mixed with water, gum, and often a little glycerine. This mixture, which can be easily removed by a damp sponge used prior to development, is effectual in ordinary cases; but when the conditions of lighting most calculated to produce halation are present, it fails to some extent; and this is chiefly owing to the difficulty of applying an even film of composition to the plates, the coating being always streaky, and thin in places.

The disadvantages incident to the methods at present in general use may be most thoroughly and completely got over by backing the plates with a dark-coloured bituminous varnish of the nature of Brunswick black. Ordinary Brunswick black, as sold at the oil shops, may be employed, or that sold as photographic black may be used; but the varnish which we have found best is a kind sold by Messrs Hopkin and Williams under the name of liquid jet. This varnish appears to be merely a strong solution of bitumen in coal tar oil, or benzole, and as it dries almost instantly, leaving a deep orange brown film on the glass, the backed plates may be placed in the dark slides almost immediately. The lines or markings made by the varnish brush disappear before the varnish becomes dry, so that thin places and streaks, such as those occurring in the case of the burnt sienna backing, do not arise. The bituminous backing in no way interferes with the operation of developing, and if the kind of varnish here recommended be employed, it is quite possible to look through the film and judge of the density of the picture as development progresses. It is, however, better in all cases to judge of the progress of development by reflected light alone, it being generally undesirable to remove a gelatine plate from the developing dish until the operation of development is finished. The progress of the fixation can be traced with great ease in the case of a plate backed with bitumen, as the contrast is considerable between the dark varnish and the light bromide.

Now as regards the removal of the varnish. The plate having been washed is, while still wet, held with one edge resting on the table, and the backing is scraped off by means of a sharp elastic-bladed table knife. If the knife is held so as to form an angle of about 25° or 30° with the plate, the varnish comes off with the greatest facility, it being quite unnecessary to go over the same ground twice. A momentary rinse in clear water is next necessary in order to wash away the loose chips of bitumen. Ordinary Brunswick black and the usual photograph black varnish cannot be removed from the plate with the same facility, as these yield tough and adherent films; and, moreover, these varnishes give films which are opaque, both visually and actinically, while the film yielded by the liquid jet is visually transparent, but very opaque to actinic light, even when the film is very thin.

In order to thoroughly prove the relative advantages of the burnt sienna backing the bituminous varnish, one-third of a plate was backed by the former, another third by the latter, and the remaining third was not backed at all. The subject on which the plate was exposed consisted of a piece of wire-netting placed over against a white cloud upon which the sun was shining. Where the plate was backed by bitumen the image of the network was clear and quite free from any deposit; while those portions of the network depicted on the unbacked portions of the plate were almost obliterated by halation. That portion of the plate which had been backed with the burnt sienna composition was by no means so satisfactory as the bitumenized portion, as a trace of halation was visible all over the lines; and where the coating of pigment had been thin, the amount of blurring was considerable.

It is to be regretted that out-door workers with gelatino-bromide do not make an invariable practice of backing their plates; for it is grievous to see, as one often does, an otherwise good picture spoiled by the more or less perfect obliteration of tree tops or chimneys. We remember, only a few days ago, seeing a remarkably fine picture, executed on a large plate by one of our most successful gelatino-bromide workers, in which a house picturesquely situated between masses of beautifully detailed foliage was crowned by a dormer window, gradually increasing in whiteness from the bottom upwards, until the apex merged into the sky. How strange such a result must appear to an artist knowing nothing of the technics of photography!

Notes.

Drs. De la Rue and Hugo Müller have employed photography with considerable success in depicting a series of results obtained by them on electric discharges in different gases. The gases, at various pressures, were confined in a bell-jar, or tube, in which were the two electric terminals approached to, or distanced from, one another at the time of the discharge, according to the desire of the experimenters. The lambent flames seen on every discharge varied, as may be supposed, as the conditions were altered, but by means of photography the results were all carefully recorded. To Mr. H. Reynolds, it seems, is due the credit of executing the camera work.

Here is an example of an electric discharge in air at a pressure of three millimetres. "Two luminosities were formed, the ring negative being surrounded with a nebulosity which completely filled the end of the tube. The tube glowed brilliantly with a blue phosphorescent light, which proved to have great actinic power. A dry plate (? gelatino-bromide) photograph obtained in five seconds records a very curious phenomenon, namely, that the outer boundary of luminosity appears *darker* than the tube." Many of the pictures are especially fine. Some exhibit wasp-like markings of bright light, while others have a shining glow-worm appearance, particularly beautiful. It is another apt illustration of photography doing yeoman's service in the cause of science.

A bath, either vertical or horizontal, containing methylated spirit, is almost indispensable in the laboratory now-a-days in the manipulation of gelatine plates. Alcohol, as everybody knows, hardens gelatine, by greedily absorbing the water it contains, and therefore in all cases where a film is inclined to become tender or to leave the glass, its immersion in spirit is desirable. A plate that has worm markings all over it by the rising of the film is made sound and firm again by a few minutes' sojourn in the alcohol bath. In cases where the film has to undergo severe treatment—as in intensifying with silver, for instance—it is well to harden the gelatine beforehand by immersion in spirit.

The gelatine plate should be drained and stood upon blotting-paper for a few moments prior to its immersion in the spirit bath, as otherwise the latter soon becomes diluted. A proper cover should also be provided to prevent evaporation.

A fine marble bust of Edwin Chadwick, C.B., is to be seen at the Royal Academy, near the entrance. It is on your left as you pass into the Central Hall. The face expreses force and determination, without being stern or heavy, and the brow and temple are chiselled with a freedom and boldness that must excite admiration. The work is that of M. Adam-Salomon, and is, we believe, the first that the renowned sculptor and photographer has sent to our Academy.

Capt. Ottomar Volkmer, in his work on the Reproduction of Maps and Plans at the Imperial Royal Institution for Military Surveying at Vienna, describes some photographic "dodges" that have the appearance of being valuable. One of these is the plan of coating, with a film of bichromated gum, a negative already partially intensified. This negative is then exposed on the reverse side, and washed in warm water; afterwards the surface of the image is freed from the gum, and the intensification of the negative is complete. The effect of this is to make the ground still more opaque, and is, therefore, very useful in photo-mechanical printing.

Another original idea is the production of a sharply-marked positive on glass for a negative. To do this the negative is coated with an insolating film, and then covered with a collodion emulsion of silver chloride; it is then exposed on the back, and afterwards stripped. In this way an image may be produced for etching upon a copper plate.

The tomb of Oliver Goldsmith in the Temple is said to show plainly the ravages of time. Would it not be worth while to secure photographs of this and other similar monuments that abound in the metropolis, before they become altogether unrecognisable? A series of photographs of this description might be published with advantage; but in any case the depiction of interesting objects of this kind is a task that many amateurs would undertake with alacrity.

Mr. Bruyère sends us a communication upon cold emulsification which well deserves the attention of our readers. It is certainly one of the simplest formula that has yet been given. Orange glass or cylinders are expensive. A correspondent says:—"Empty the contents of a sixpenny bottle of Judson's orange into a small beaker, add a few grains of bichromate, a drop of carbolic acid, and twenty grains of gelatine; place the beaker in hot water, and apply like collodion. If a brush is used, two coats are necessary. This will cover two square feet."

WE are to have more photographs of the Polar regions. According to *Nature*, the steamship *Eira* has left Peterhead on a voyage of discovery to the Arctic Ocean, coaled and provisioned for two years. "She has a crew of some twenty-five, and carries a photographer, the same who accompanied Captain Nares."

Mr. Belcher's proposal to employ the Norwegian stove for cooking emulsion is a happy idea. Any felt-lined box will answer the purpose, supposing the vessel containing the emulsion is closely wedged in all round with the felt The plan suggested of lighting the dark room by means of lamp and reflector outside the orange window is also a plan deserving of consideration.

Strange things happen every day, but not so strange as this. Said a fashionable beauty to a fashionable photographer, whose taste and skill had many times been exercised in her favour, "I see you let Mrs. Gushington have one of my poses." The photographer scarcely understood. "One of my poses or positions, I mean; I don't like people having them without permission."

Topics of the Day.

SURVEYING BY PHOTOGRAPHY.

BY LIEUT. L. DARWIN, R.E., HON. SEC. OF THE PHOTOGRAPHIC SOCIETY.

MANY methods of surveying by photography have from time to time been proposed, and an attempt to utilize photographs taken in an ordinary camera in this manner has lately come under consideration. The plan proposed may shortly be described as follows.—The country to be mapped is first covered with a network of triangulation, taken by the ordinary methods of surveying, by the theodolite, or possibly by the sextant, the prismatic compass, or the plane-table; that is to say, the positions of the most prominent objects in the country are fixed and marked on the map. It is only after this preliminary work has been completed by the surveyor that it is proposed to ask assistance of the photographer to help to fill in all the details of the plan.

If complete panoramic views are taken from some of these fixed positions, these photographs may, theoretically at all events, be made useful in determining the position on the plan of other points not yet fixed by triangulation. The only condition necessary for this is, that in each photograph three already determined points should be visible. To make our meaning clear, let us consider photographs taken at two points of the fixed positions A and B, and see how the positions of a point, C, not yet fixed by triangulation can be found with their help; it is supposed that C is visible in two photographs, one taken at A, and one at B. The photograph taken at A is placed on the plan on which the triangulation has been drawn so that each of the three fixed points is situated on the lines of the triangulation drawn from the point A towards these three points. Then it can be shown mathematically that if a line is drawn from A through the point C on the photograph, whilst held in

the above described position, the point C will be on that line in the plan.

The same can be done from B, and consequently the intersection of these two lines from A and B determines the position on the plan of point C. To make the method theoretically correct it would be necessary in all cases to take vertical projections of the points on a horizontal line, and not the points themselves on the photograph. We have thus the means of determining the position of any object which can be seen in two photographs, and in this manner all the roads, rivers, houses, &c., might be drawn on the map, and the work completed. The first question asked by a photographer undertaking such work would be, What lens shall I use—a long focus lens, or a wide angle lens? If a wide angle lens is used, the distance looks so small that different points could not well be distinguished and recognised in two photographs; but if a long focus lens is used, it may be necessary to take as many as ten photographs at each station, in order to get the complete panoramic view. As rapidity is one of the chief points claimed for surveying by photography, a wide angle lens must be chosen, when the panorama might be completed in five photographs. Besides which, it must be remembered that three fixed points are wanted in each photograph, and in order to get as many as thirty points visible round each of the photographic stations, the work of the triangulation would have to be vastly increased; to get fifteen clearly visible stations is quite difficult enough. Hence we are driven to use a wide angle lens, notwithstanding its disadvantages. Not only must many of the stations themselves be clearly distinguishable, but the ground in front must be commanded, so that every unfixed point must be visible from two of these photographic stations. How if there are no hills or natural elevations?

This question has received no satisfactory answer, and it may be assumed, we think, that the plan would fail utterly in a flat country; even in a fairly hilly country, if much cut up with hedges, trees, and woods, it will be very difficult to obtain all the detail without an immense number of photographs. But even if the country is all that could be desired, the difficulties to be encountered by the photographer will be very great.

The surveyor can work in nearly all weathers, and if the photographer is to help quicken the work, he must be prepared to go out whenever required. But it must not blow too hard, or in the exposed situations in which the stations must necessarily be placed the camera is sure to shake; on the other hand, if it is a hot, still, hazy, summer day he will find it very difficult to photograph any distant object. It must be a bright day to get a good picture, but bright sunshine will make it almost impossible to take a photograph in the direction of the sun; if the sun is very high this difficulty will not be so much felt; and in any case it can be overcome by visiting the position at intervals of some hours; but how about the rapidity of the process in that case? There must be no mist, no haze, no smoke; a very little smoke drifting to the lee side of a town or manufactory makes it curiously difficult to obtain a photograph of the distance. These are the chief difficulties that the photographer has to contend with—difficulties enough to render any work of this sort impossible during an English winter. But let us suppose that he has had exceptional luck, and has succeeded in obtaining a perfect series of panoramic views. He hands prints from these negatives to the surveyor whose duty it would be to complete the map from these materials; the photographer had a difficult job, but we think the surveyor will have a still worse time of it. Supposing that there is a river winding in front of our conveniently situated hills, and that the first effort is to map such a readily recognised object as this. It is not enough to see the river on two photographs, but we must be able to recognise the same spot on the bank, or bend in the stream, in both pictures; but from two points of view the same point may present a totally different appearance, and it is only those who have actually tried to recognise an object of any sort in different pictures that will be able to thoroughly appreciate the difficulty. The same difficulty will be found in plotting almost every natural object, and in consequence it will be found almost impossible to complete the map by this means. In all methods of surveying, as far as we are aware, the surveyor visits almost every point which is to be marked on the map, but in this place an attempt is made to put in the detail from some little distance, and the consideration of this fundamental difference would alone be enough to condemn the plan.

We have only been considering this one plan of photographic survey in which the ordinary camera is used. There is the Chevalier plane-table, no doubt known to many, which accomplishes much, while other mechanical contrivances have been proposed by which the panorama is so taken that angles can at once be read off, thus rendering the preliminary triangulation unnecessary. This of course removes some of the objections that we have pointed out, but our readers will readily see that many of the difficulties remain in full force; strong enough, we consider, to prevent any plan of photographic aid to surveying being practically useful. The practical test of any system is the only one of much value, and until we see a map which has been produced with photographic assistance we must be excused from thinking that all such plans are failures.

The "Topic" for next week will be "Mounting Photographs," by Payne Jennings.

COLD EMULSIFICATION.

BY H. BRUYERE.

THERE seems to have been but little attention paid to obtaining a sensitive gelatine emulsion by the means of cold emulsifying. Considering the ease of preparation, the avoidance of those evils, attributed, perhaps erroneously, to a prolonged heating of the gelatine, these advantages combined with the facility of obtaining different degrees of rapidity, and with the certainty of easily reproducing them, seem to indicate that this method is deserving of more attention than is at present bestowed upon it. The only objection the writer believed might arise, would be in a want of sensitiveness, but he was somewhat gratified to finc that after six days' emulsifying the plates vied in rapiditd with the quickest in the market. Perhaps the time necessary for the attainment of this sensitive condition might be comy mercially objectionable. A cold emulsification may b- formed either in a diluted glycerin, or in a solution of gume arabic; the writer prefers the latter. Subjoined is a bu- slightly altered formula of Mawdsley's:—

Distilled water	4 ounces
Gum-arabic	120 grains
Ammonium bromide	80 ,,

Place the ammonium bromide carefully in a stoppered bottle, pour on the water, then add the gum, agitating occasionally till dissolved. No fear need be entertained of the gum bromide solution becoming acid, having kept several batches of emulsion for a lengthened period, without perceiving any decomposition. This seemed to verify a suspicion that all the haloid salts are anti-putrescent, the cheapness of the sodium chloride determinating its use.

When the gum is dissolved, 125 grains silver nitrate are dissolved in two ounces of distilled water, and added by degrees to the gum solution, shaking vigorously between each addition. This formula gives a little over one grain of bromide per ounce in excess. Of course this last operation must be performed by a perfectly non-actinic light.

No more trouble need be taken with the emulsion, except to most jealously guard it from the weakest actinic ray.

At the end of six days, or any time that may be convenient, add to each ounce of the emulsion forty to fifty grains gelatine, allowing it to soak in the emulsion for a short time; then dissolve with as low a heat as possible. On account of the small amount of heating the gelatine undergoes, this process gives a perfect immunity from frilling, for during the writer's practice he is unable to recall one example, though this may equally be due to the polishing powder he uses, a mixture of ground alum and French chalk. A slight film of alum seems to attach itself to the hygroscopic surface of the glass; its power of preventing frilling is well known. The French chalk, apparently, is somewhat empirical, some extolling its capacity of making films adherent to their supports, others using it for the totally opposite purpose. It is unnecessary to describe the operations of coating, drying, &c., with the exception of washing, and it may be heretical to avow a disbelief in thoroughly washing away the free bromide, being convinced that a trace of free bromide is necessary to the stability of the sensitive surface, and understanding, by stability, freedom from stains, easiness of intensification, and absence of that peculiar veil over the shadows which ensues on a surface formed of pure bromide of silver when under the action of a reducing agent.

This opinion has been formed from an analogous action which takes place on the wet film. It is a well known fact that the formation of bromo-iodide of silver in the collodion film is not simultaneous, the iodide forming quicker than the bromide, and there is a point at which the plate is at its best; in this condition the film is found to contain a minute portion of free bromide, which confers on the image that cleanliness, gradation, and transparency in the shadows absolutely necessary for the production of good prints Past this point the whole of the bromide is converted into bromide of silver. What ensues? Sensitiveness is certainly gained, but at the expense of every quality characteristic of a good negative. The image develops flat, the shadows are veiled, and the results are difficult to intensify. An extended observation of dry plates developing in this objectionable manner makes us suspect that the result springs from the same cause. A seemingly valid objection might be urged, that the excess of bromide would crystallize in the film; but objectors must bear in mind the peculiar action colloid bodies possess of arresting crystallization; the gelatine used in colloid press printing contains a relatively large quantity of bichromate without showing any tendency to crystallise. The other colloid, albumen, when used in the negative albumen process, absolutely contains the bromide in question, but so transparent is the film, and so completely has the crystallization disappeared, that it requires an experienced eye to detect the prepared side of the plate.

In our present knowledge of gelatine emulsion some difficulty may be encountered in finding the amount of free bromide necessary to leave in the film, but this difficulty is, we think, but apparent, the manufacturer having so completely under his control the combination of the gelatine, the period of washing, and the amount of water used.

Correspondence.

OXALATE DEVELOPMENT.

SIR,—You may not think it a very important matter, but I can assure you that it is, to ladies who practise photography, to deal with solutions that do not stain the hands; although for myself I do not mind soiling my fingers when it is really necessary. The gelatine plates, from the fact that they are better developed in a dish than in the hand, have already done much to avoid stains on the fingers, but you must at times come into contact with the solution when you lift plates from the bath, &c. For this reason I would say to my sisters, employ the oxalate development rather than that with pyrogallic acid. If you do this, even when you are dipping your fingers continually in the developer, you never stain them. The same cannot, however, be said of liquid in which pyrogallic acid is dissolved. I never use finger-stalls now, and yet no one could divine that I dabbled in photographic operations.—Yours sincerely, A. E.

Norwood, June 26th.

GELATINE DRY PLATES AND WASHED EMULSIONS.

SIR,—In common with many other photographers, both amateur and professional, I am glad to see Mr. R. M. Gordon's communication in the NEWS after so long a silence.

We all know that anything he writes will be worth the reading of all interested in the advance of photography. He does not tell us, however, what English make of gelatine plates he tried against Herr Obenetter's. As I know, after trying many makes of commercial gelatine plates, there are makers and makers, and plates and plates, and they vary as much in goodnees and value as photographers and photographers, from the bottom of the scale to the top.

According to Mr. Gordon, Herr Obernetter's plates required no intensification, and there are certainly plates to be had in England that rarely require it if carefully developed, especially with glycerine added to the pyro developer, as in Edwards' valuable formula.

Mawdsley's and Bennett's excellent plates certainly rarely require it. The mercury and ammonia intensifier requires much care and judgment, or too much intensity is got, so that printing is impossible, even in the sun.

I see that Mr. Kennett states that gelatine washed emulsion would not keep; if that is so, this does not apply to washed collodion emulsion, as I have some of the Liverpool Dry Plate Co.'s emulsion now by me quite good and sensitive that I got in 1874. About the same time I got some of Colonel Wortley's uranium emulsion (unwashed), which kept good about a year; if it had been "washed," no doubt it would have been good now. It was a splendid emulsion, and gave equal negatives to wet plates, and more rapid than bath plates when used wet. I tried both this and the Liverpool emulsion a few weeks ago. both were sensitive, but the Wortley emulsion would not clear in hypo or with cyanide, and was practically worthless. I have some ounces of it now left, and should be glad to know whether Colonel Wortley or any of your readers can inform me how it can be utilized and brought back to its former state of perfection.

I have found, like Mr. Gordon, that gelatine films won't accept of silver, and the only reliable intensifier in my hands has been the mercury and ammonia, which rarely fails. FRANCIS WM. TURTON.

RECEPTION ROOM DUTIES.

SIR,—I read with interest the article in your paper a fortnight ago on "Reception-room Duties, by a Lady," and also the letter in your last week's issue by "A. D." As I think the latter's system not the simplest that might be, I venture—if you can afford the space—to give mine. Of course, no matter what method is pursued, the work must be done, and the question is how to accomplish that work well and satisfactorily in the shortest time and with the least trouble.

In the first place, the reception-room is opened at nine o'clock, and the first thing I do is to prepare my negatives for retouching. I then dust and arrange the reception-room. The prints are now brought from the printing-room, and at the same time I give the printer the orders that I have taken the day before. I am now ready for retouching the negatives. This, perhaps, takes me two or three hours. They are then sent to the printer to be put into the frames at once, and proofs printed. The mounting next claims my attention. The prints are wet, just as they have come from the

bath after washing all night. The printer cuts them before washing and toning, thereby saving the clippings, the sale of which brings in a few pounds a year. With an efficient printer, the prints should never require looking over, as in doing so I think there must be great danger of jagging the edges and rubbing the albumen. I never have any difficulty in mounting my prints straight away, and if I should find one that ought not to be there, I do not mount it.

The spotting-out occupies me all the afternoon with the frequent interruptions of clients; and I may here say, that it requires a lady of a very equable temper indeed, always to respond to these interruptions with cheerfulness and alacrity. Nevertheless, it is an absolutely necessary attribute, and an attendant who wishes to succeed in her profession must ever evince that ready desire to meet and carry out the wishes of all clients which will ensure their confidence. My photographs are now ready for sorting; but before doing so, I mark each one at the back with the month and year in which the negative was taken. Thus: "7-80 (July 1880)." The negatives are kept with paper between each one, in packages to correspond; of course the printer has entire charge of these. When an order comes in from an old negative, a carte is almost invariably sent with it, as in an old-established business like this a system gets well known. We have now only to look at the date, turn to the corresponding package, and the negative is found in a few minutes; and although we have many thousands of negatives, there is not the slightest confusion. We do not preserve those that have not been ordered from. We certainly could not keep a catalogue of them all with a print from each mounted in it as your correspondent "A. D." does. I think such a system must entail a great deal of waste time and labour. The proofs are now ready for sending home. This I do by putting them between blotting paper, and when they are returned the numbers required are written on the back of those approved of, with any alterations that may be required in the printing. I have now to add up my day's cash receipts, all orders, addresses, &c., being booked at the time of their being given. Any correspondence I may have is done at this time, and also the sending away of photographs. Thus ends my day in the reception-room — Yours, &c., M. P. B.

HINTS FROM THE ANTIPODES.

Dear Sir,—As a constant reader of the News, which I look forward to with much delight, I have great pleasure in sending a few hints which, although from the other side of the world, may not come amiss. For a long time I have taken deep interest in the "Emulsion Process," in which I have succeeded with various results. No doubt it will be the process of the future; but for the present with me it is in abeyance. One great difficulty here is our grand light in this glorious country even in the depth of winter; but that can be overcome in time.

Now for hint the first. It is a plan I have hit upon for cooking the emulsion without fire and at a constant temperature—in fact, at whatever degree you like to start with, from 50° to 212°. For a long time I puzzled my head to overcome the difficulty of lamps and night-lights &c., and their uncertainty and dirt; at last I remembered reading some years ago of a cooking box lined with felt, into which the vessel with food to be cooked was placed. After being started to boil, the tin was placed in the felt-box, fastened down, and went on cooking by itself. The very thing! thought I, and it is. Try it! I have sent a sketch of box.

The next hint is about lighting the darkroom, which is as simple as possible. I have a large darkroom and studio (of which more bye-and-bye). My darkroom window is 4 feet wide by 2 feet 6 inches high, covered with orange tissue paper and for emulsion Turkey red. This is nothing new, of course; but make a lamp with reflector to stand on a shelf outside the darkroom window, and you have a fine reliable light in your room, without any possibility of any light from lamp ever coming in the dark room.

I have sent you a proof from a collodion emulsion plate, and the plan I have adopted is very simple, and I have succeeded with it without one single failure. Formula: Thomas's ordinary plain collodion, 2 ounces; bromide of cadmium, 20 grains; after standing a day add 4 drops of aqua regia; sensitized with 22 grains silver in hot alcohol 4 drachms, adding the collodion to silver, and shaking. I never filter, and always get fine plates. I preserve with coffee and pyrogallic. I do not back with anything, but put yellow paper at the back of negative when exposing.

I will send word how I proceed with gelatine.—Yours,
South Australia, April 20th. E. W. Belcher.

Proceedings of Societies.

Liverpool Amateur Photographic Association.

The monthly meeting of this Association was held on Thursday evening, the 24th ult., at the Free Library, William Brown Street, Mr. J. H. T. Ellerbeck, President, in the chair.

The minutes of the last meeting were read and confirmed.

The Secretary announced that in consequence of his application to the G. W. R. as to the overcharge for the members of the excursion to Shrewsbury, he was enabled to return to each individual who left Liverpool on the occasion the sum of 3s. 6½d.

The President gave the following humorous description of the June excursion to Ruabon:—"A small party of irrepressibles left Liverpool on Thursday, the 17th instant, for Ruabon, and, under the guidance of Dr. Kenyon, invaded Wynstay. In spite of threatening clouds, which damped (not their spirits—they hadn't got any) the foliage in the magnificent park through which the road lay, the drive to Nant-y-Bellan was very enjoyable, and on arriving at the Tower the party alighted, and descended to river, where much water was shipped, and the cameras unshipped. Here several shots were fired, but the best subjects were hidden by the intervening mist—in fact, were missed altogether. Still, though one gentleman, slipping down a *bank*, *ruptured* his nether garment, they were not *bankrupt* in resources; and though distant views towards Ruabon were denied, they could not *rue a bondage* which confined them to such a charming locality. Subsequently the journey was extended to Erbistock mill. The river here was dammed considerably, and its fall was great (about a dozen feet), and the trees cast dark and mysterious reflections upon it. Indeed, the place was so fascinating that it was with great difficulty any of the cameras could be got away. At last the goal was reached (Erbistock)—a little village, a little church, a little ferry, and a little inn combined to make this a spot worthy of photographic attention. Here Beer was in his element and Wood burned with enthusiasm. The inevitable ham and eggs were ordered, and the neighbourhood explored, but not exhausted. There remained only one plate left for a group, and the party being small, the landlady's daughter was pressed into service to manipulate the exposure, but she laughed so that even the camera was moved, till after (to laughter) tea, when the members exhibited a more satisfactory disposition to sit. I am afraid our driver had too much to drink, as you will see by the photograph he sees or looks double. In consequence of movement, however, though not sharp in the picture, he looked sharp afterwards to catch the 6 p.m. train, which was half-an-hour late. The excursion delighted all, the only regret being that those for whom the day was arranged had failed to avail themselves of it more fully."

Prints from negatives taken at Erbistock and the Ferry by the President and Dr. Kenyon were exhibited, and highly appreciated.

The President spoke at some length in advocacy of the occasional selection of special subjects for competitive work among members of the Society, and suggested that a prize should be provided from the funds of the Association, and thus that a stimulus to good and artistic work be afforded. After some discussion, the proposal was unanimously agreed to.

The Secretary then read a paper on "Gelatine Films as a Substitute for Glass" (see page 315), and illustrated the paper by a demonstration of the whole process.

Mr. W. H. Wilson thought that it would be far simpler and better to apply the ox-gall to the surface of the glass, by way of substratum, and then to add the plain gelatine, which was afterwards to be sensitized.

The Rev. H. J. Palmer said that he had tried this plan repeatedly, but had found it unreliable, since the film occasionally declined to be separated from the glass surface. He had also tried wax in methylated spirit, and French chalk, as substrata; but these also could not be depended upon to fulfil the desired object; whereas the ox-gall was unfailing.

Mr. Kirkby asked if Mr. Palmer still adhered to his former doctrine, that it was necessary to compose the emulsion with thirty grs. of gelatine to the ounce, in order to secure homogeneity between the supporting and sensitive films.

Mr. Palmer thought it was theoretically better that there should be the same proportion of gelatine in each of the films, in order to avoid the difficulty of curling in the developing dish. At the same time, he admitted that in the last prepared batch of films he had used an ordinary twenty-grain emulsion upon a thirty-grain support without inconvenience.

An outdoor meeting was then arranged for the third Saturday in July at St. Michael's Hamlet, in acceptance of a kind invitation from Mr. Wilson. The meeting then adjourned.

Glasgow Photographic Association.

A special general meeting of this Association was held in Religious Institution Rooms on the 17th of June, to receive the new rules of the Association, with the relative rules for artistic competitions, framed by the Secretary, and approved of by the council, Mr. John Urie, the president, in the chair.

After careful consideration the meeting made some additions to and alterations in the rules, and ratified the same, as so altered, as the rules of the Association, and instructed the Secretary to have them printed, and a copy sent to each member.

The meeting then proceeded to consider the resolution of council as to the proposed competition among the members, and the regulations framed therefor.

After long discussion the meeting unanimously resolved :—

1. That there be four competitions; viz., two competitions confined to amateur members—one in landscape, and one in figure; and two competitions open to the whole Association—one in landscape, and the other figure.

2. That each picture, bearing a motto only, accompanied by an envelope bearing a similar motto outside, and containing proper name and address, must be sent to the secretary on or before 1st November next.

3. That the envelopes bearing the mottoes of the winning pictures be opened by the judges, and the names of the winners declared by minute, signed by the judges.

4. That the size of the pictures in landscape be not less than half-plate, and in figures same size, but the figures must appear as the principal subject in the picture. The pictures must be taken direct from the negative, and are not to be retouched.

5. That three gentlemen, not necessarily members of the Association, be appointed by a general meeting to judge the pictures, and determine all matters relative to the competition, the competitors, and the exhibits; and their decision in all matters shall be final and conclusive.

6. That a first prize be given for the best picture in each competition. The prizes will be silver medals.

7. That the pictures be obtainable by the owners if called for within one month after intimation given to that effect in a circular calling a general meeting. Unclaimed pictures shall become the property of the Association, and the envelopes bearing their mottoes shall be destroyed, unopened, by the secretary in presence of the council in meeting assembled. Persons claiming pictures must hand the secretary a duplicate of their name and address as contained in the envelopes bearing their mottoes. On opening, the secretary, if satisfied with the claim to ownership, to return the picture; if the secretary is not satisfied, the claim shall be referred to the council for final decision.

8. That the Association have the power, if they think proper, of printing and presenting to the members copies of the exhibited pictures, or any of them, for which purpose they shall have the right to the use of the negative; but it shall be returned to the owner after the requisite number of prints are obtained from it.

The President announced that he would give a silver vase for the best picture exhibited in the whole of the competitions. The meeting therefore resolved that the picture gaining the president's prize should be excluded from competing for the other prizes.

The meeting unanimously awarded the president a vote of thanks for his prize.

On the motion of Mr. Dodd, seconded by Mr. Gardner, the meeting unanimously resolved that a roll, showing the names and addresses of the members of the Association as at this date, be printed and a copy sent to each member, the roll to be made up from the treasurer's book.

To Correspondents.

A. B. T.—We can only answer your question approximately; you should have given the *equivalent* foci of the lenses. Assuming No. 1 requires 20 seconds, with the full opening, then
No. 2 ,, 2 ,,
No. 3 ,, $3\frac{3}{4}$,,
No. 4 ,, $6\frac{1}{2}$,,

Edward T.—The chloride of gold requires neutralising, because it usually contains hydrochloric acid; carbonate of lime or chalk does very well. Payne Jennings employs the ordinary acetate bath, with sometimes a little carbonate added.

W. H. P.—The question of fixing is one fraught with considerable difficulty. According to Herschel, three parts of crystallized hyposulphite will dissolve about one part of chloride of silver. But, unfortunately, there are two different silver compounds formed by the action of hyposulphite on the chloride, and in the presence of an excess of the latter, strangely enough, *less* is dissolved. Another point is, that you do not know how much chloride there is on a sheet of paper, for the contents naturally vary with circumstances. For careful work, one ounce of hyposulphite per sheet has often been recommended for fixing, and we ourselves prefer this proportion, although it is a little extravagant compared to that you mention. You must remember that the hyposulphite solution gets weaker by use and by keeping; but you might, if you like, preserve it for twelve days in the way you mention, taking care to allow a longer time for fixing. Your printing bath should give you no trouble, and turning colour should have no injurious effect on prints. See answer above.

W. M. R.—We have had no difficulty in getting sheet gelatine, large quantities being made for bonbons, &c. If you cannot get it through a photographic dealer, try Mr. J. Green, 44, Ridley Road, Dalston.

A. A.—1. If you like. 2. No lens should have a stop with a diameter less than one-fortieth of its focal length.

Enamel.—Look in our "At Home" this week. M. Liebert's plan of enamelling is certainly a good one. There are several firms who undertake the work, as you will see in our advertising columns or we can refer you to a Paris house if you like.

Gelatine.—1. Immersion in methylated spirit is the best remedy we know; it hardens the film and renders it more capable of sustaining severe manipulation, or it will contract the film and restore the same, supposing the gelatine to have lifted from the plate. 2. Mr. Payne Jennings recommended it some time since; he always prefers to collodionise his gelatine negatives rather than varnish them.

A Working Photographer.—Your questions have been inserted in the form of a letter, which will appear next week.

W. G. H.—We frankly say we don't know how you can improve the lighting; the results are so good that there is very little room for improvement. Gelatino-bromide plates well handled will give you as good results, but few studios have adopted them regularly, or, in other words, abandoned the silver bath. See our Correspondents' column last week about Snow. We should certainly advise you to make an essay of gelatine.

James Neville.—You will find two valuable papers on the subject of photography and wood-cutting in the News of 3rd Jan. and 6th June, 1879; our Publishers can supply you with them.

P. F.—See Dr. Eder's paper in last week's News; if you have very much over-expsosed, the solution of your difficulty is there described.

A. Read.—See our leader on positives and "At Home" last week. You cannot do better than employ the gelatino-bromide paper.

H. Grant.—Standard silver contains 7·5 per cent. of copper, so that you have a considerable quantity of copper dissolved with your silver. You must be careful how you manipulate, for the operation is one that needs the skill and knowledge of a chemist. The crystals are of no value at present; you must dissolve again, and separate your silver by the addition of hydrochloric acid. The precipitate will be chloride of silver, which you must separate and reduce, and further dissolve again in nitric acid. But when you get your chloride you would do well to hand it over to an assayer to be worked into nitrate. It would not be worth your while to make iodizing solution to add to plain collodion.

W. G. H.—The registration fee for each would be 1s. 6d.

Gougalum—Norman May—A Countryman.—Shall appear in our next.

The Photographic News, July 9, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

The Permanence of Coloured Photographs—A Small Hot-air Engine for Electrical Purposes—Instantaneous Photographs—Photographic Reproduction.

The Permanence of Coloured Photographs.—The question of the alleged adulteration of artist's colours introduced by Mr. Holman Hunt has not a little connection with photography. If it be true—and there is little reason to doubt it—that a chemical reaction is set up between different colours when mixed together, how much more risk must there be when the colours are laid upon a chemical substratum, as chloride of silver, with perhaps an addition of a small quantity of hyposulphite! It is an unfortunate truth that coloured photographs rapidly change, and it would seem, indeed, as if no colour when laid on a silver print was able to stand for any length of time. Carbon prints are doubtless much safer. This is a matter our print-sellers should look, to as to buy (say) one of Mr. Payne Jenning's exquisitely coloured landscapes, under the impression it is going to be a "thing of beauty and joy for ever," and to find its tints gradually changing into an indescribable neutral smear, streaks making their appearance, and blotches following suit, is one of the most exasperating things under the sun. Of course, the sole fault does not lie with the manufacturer of colours; some of the blame must be attached to the artist who makes an injudicious mixture. But to ensure a safe amalgamation the artist should have some knowledge of chemistry, and ought to know what his colours are composed of. It is by no means certain that if Mr. Holman Hunt chose to test the question he could not bring the Adulteration Act to bear against the colourman who sells as Naples yellow something which is no more the Naples yellow of the older artists than chalk and water can be called milk. Now, if Mr. Hunt took this action and proved to be in the right, every tube of pigment would have to be described something like the following: "Venetian Red, a mixture of"—well, whatever may be the ingredients. The artist would thus see at a glance the danger which would arise by the mingling together of certain chemicals, pre-supposing, of course, that he has gone through the proper curriculum of chemical study. We fear, however, this union of science and art will never take place. Imagine Sir Joshua Reynolds or Turner being deterred from the production of any tint they had set their hearts upon by the fear of its not proving permanent.

A Small Hot Air Engine for Electrical Purposes.—That the electric light will be in general use in the studio is pretty certain. It is only a question of time; M. Jamin, as our French correspondent noted last week, has been very successful in solving the great problem connected with the light and the divisibility of the electric current; and this accomplished, the next question is the best form of motive power to work the electric generator. M. Jamin uses a gas engine, and no doubt such an engine is very efficient. The smallest gas engine, however, that can be procured occupies some considerable space, while in many cases the noise of the successive explosions by which the motive force is produced is very objectionable. So far as mere description goes, a hot air engine called by the inventor "The Tom Thumb Hot-air Engine" would seem to offer more advantages than the gas engine, both in simplicity and size. The *Scientific American*, which contains a diagram of the apparatus, says that its success is based on employing a comparatively low temperature, 250° to 300° Fah. producing a pressure of four to five pounds per square inch, and operating on a broad diaphragm piston of relatively short strokes. The piston is formed of two circular metallic discs having between them a flexible diaphragm composed of a layer of vulcanised gum-elastic sheet; over this, externally, a layer of canvas, which protects the gum, and permits it from yielding to pressure. The heater presents some novel features, the heating surface being greatly increased by numerous thin plates or ribs cast in connection with the bottom, and rising almost to the top nearly the whole length. The heat being applied to the bottom of the box, the lower edges of these ribs are virtually in the fire, and thus the whole are readily kept at a suitable temperature. At the bottom of the apparatus is another piston box similar to the first, but larger, and having its piston below, or a valve in it opening inwards. This is the air-pump, and it is connected with one end of the heater by a pipe which has an automatic valve at the lower end opening upwards; as this piston descends it fills the box with air, which in ascending is forced into the heater, and the valve in the pipe permits its return. The other end of the heater is connected with the upper piston box or meter by a pipe always open, the two forming one chamber. By this series of valves a succession of hot and cold air is made to circulate through the apparatus, raising and depressing the piston, and so putting the machine in motion. The engine is difficult to describe in all its parts without the assistance of a diagram, but is in reality of extreme simplicity, and therefore could be constructed cheaply. An engine suitable to propel a sewing machine is about twenty-five inches high by thirteen wide, and heated by an oil or gas-stove. An engine forty-five inches high is a quarter horse-power, while the full horse-power is six feet high by three feet wide. The inventor is a Mr. J. Jenkins, of Philadelphia.

Instantaneous Photographs.—The Photographic Exhibition of October next should present a host of wonders in the way of instantaneous effects. With a gelatine process capable of producing a photograph in a hundredth part of a second (we quote from the last discussion of the Photographic Society), what may we not anticipate! Breaking waves used to be considered the *ultima thule* of instantaneous photography: they are now no longer as *caviare* to the multitude. Imitators of Mr. Gale's famous "swallow" will be as plentiful as blackberries, and no doubt we shall have some adventurous photographer endeavouring to secure a representation of the flight of the eagle, or, possibly, a streak of lightning! There is one class of subjects, however, which we are inclined to think is wholly a waste of time to take any trouble over as exemplifying the capabilities of instantaneous photography. A picture of a bicycle in motion, for instance, which the photographer proudly exhibits as an extraordinary achievement, really conveys no idea of instantaneity, and the more rapid the exposure, and the more perfect the picture, the less sense of motion is conveyed. "Look how perfectly every spoke is defined!" exclaims the delighted operator. Exactly, but he could say no more had he photographed the bicycle when standing quite still. The same with a steam engine. We may presume that the engine is going at the rate of twenty miles an hour, because we see the steam coming out of chimney, and because—*the photographer tells us so*. But what is there besides to indicate speed? Turner's famous picture of "Rain, Steam, and Speed," gives one a much better idea of a train in motion than any photograph could, and yet what is there discernible? Nothing but the faintest possible indication of the outline of a steam engine—the wheels, in fact, being scarcely visible. Had Turner painted the spokes, what an absurdity he would have produced! Now, in the case of animals the matter is altogether different. The idea in the mind of a horse's or a dog's legs when in motion is distinct in itself, and cannot be confounded with anything else; hence the triumphs of instantaneous photography would seem to lie in this direction. The possibility of success in photographing moving animals opens up, however, some curious speculations. Is it not possible that our artists, in drawing horses galloping and dogs running, have been all wrong? The conventional idea of a horse's legs in motion is one thing, their appear-

ance in real life another. It would be somewhat remarkable if photography were to show that the correct representation of cantering, trotting, and galloping was something totally different from what we have hitherto believed it to be. Photographers have already exposed a few artistic blunders, and it is quite possible they may lay bare a few more.

Photographic Reproduction.—The establishment of a technical school for photographic reproduction processes at Salzburg suggests whether something of the kind could not be formed in connection with the Science and Art Guilds. The examinations already proposed are very well in their way, but do not go very far. Photographic reproduction is but in its infancy and is certain to play an important part in the book and newspaper illustration of the future. Already it has begun to elbow wood engraving out of the field, and "process," as it is technically called, is used to a much larger extent than the public imagine. We can call to mind three or four illustrated journals, the majority of the pictures in which are produced by the aid of photo-lithography and photo-zincography, and in the very best examples it is difficult to tell that they are not wood cuts. Of course, the limit to the production of effect by means of "lines" only confines these pictures to a certain class of work, but if a method by which a "tone" could be readily produced were ever discovered, an enormous stride in advance would be gained. This is a branch of photographic art which the Guilds of Science and Art might well take up, and we trust they will not lose sight of it.

A NEW INSTANTANEOUS SHUTTER.

BY G. L. ADDENBROOKE.

I should be glad to make a few supplementary remarks on the instantaneous shutter working in front of the plate which I described in your paper of the week before last. Since that time Mr. England has tried the shutter with perfect success, the resulting negatives being sharp, brilliant, and very evenly exposed. Not in any of my experiments have I found the least trace of that indistinctness about the fine lines which shows that the camera has moved during exposure. It works, too, with so little noise that a sitter or animal would be unaware when exposure took place. In addition to being used in front of the plate it may also be placed either just behind or before the lens, preferably the former, and in cameras above whole-plate size I should advise its being used in this position. If in this case the axis of the shutter were placed as low as possible, the whole of the lens would be perfectly uncovered and free to act on the plate during a good portion of the exposure, whilst during the remainder, the middle distance would receive more light than the sky, and the foreground than the middle distance, thus securing an even lighting, and which most shutters are far from giving.

It seems to me also that this shutter will be very useful in exposures of about half a second, now so often needed with gelatine plates, and so difficult to secure, as it is impossible to uncap and cap a lens in this time, and most instantaneous shutters are, on the other hand, far too rapid. If, however, rapidity is sought, I do not see why the exposure should not be indefinitely shortened by strengthening the elastic band and spring. Whether the shutter is used just behind the lens or before the plate, it is equally entirely inside the camera, and does not offer any opportunity for the entrance of diffused light.

I myself have but little leisure during that part of the day when experiments on instantaneous shutters must be made, and therefore must be excused not having greater results to show; but perhaps anyone trying a shutter of this description will send a line to say how it succeeds.

At Home.

MR. ROBERT SLINGSBY AT LINCOLN.

There is this difference between photographic studios of our own country and those on the continent. Abroad, the capitals appear to absorb all the best photographers; with us, men in the first rank are to be found as well in the provinces as in town. Mr. H. P. Robinson, of Tunbridge Wells; Mr. Jabez Hughes, of Ryde; Mr. J. E. Mayall, at Brighton; and Mr. Slingsby, of Lincoln, are examples of this. Good work steadily makes its way, no matter where it is executed, and if only photographers had the advantage of exhibiting their pictures in public a little more, their claims as artists would soon be undisputed. They will not be long without this advantage, and it may be well to record here the success that has been attained already by a single photograph, with the limited publicity at present at our disposal. We speak of "Alone," a picture that has drawn more criticism, laudatory and hostile, than any yet produced by the camera. When we visited Mr. Slingsby, at Lincoln, a few days since, he was still busy printing "Alone," and he will apparently be condemned to go on with the work as long as the negatives last. The composition is well-known to our readers; a placid sea washes the foot of some white sandhills, and in the foreground, alone, is a dainty little lady in summer costume. One hardly knows which to admire most, the rare charms of the maiden, the bright seashore that stretches along the picture, or the smooth hillocks of sand, so fine and silvery that you long to pass it through your fingers. Mr. Slingsby has had no rest since he exhibited that picture on the walls at Pall Mall. It mattered little whether it was produced at Lincoln or Timbuctoo, said Mr. Slingsby to us: "Only one copy has been sold at Lincoln, and that was never paid for." But no picture produced by the camera has ever brought its originator such substantial reward, the sum already paid being more that that fetched by many a clever painting exhibited at the Royal Academy. In the words of an official accountant, we may say that we have examined Mr. Slingsby's books, and find that £450 has already been received on account of "Alone," and the popularity of the picture seems to be increasing rather than on the wane. This fact will be of interest to many, we are sure, if only to prove that an artist can make it pay to do pictures by photography just as well as with brush or crayon.

Mr. Slingsby's compact little studio is situated in Lincoln's principal thoroughfare. Lincoln, we need scarcely remind our readers, is a cathedral town, and Mr. Slingsby's general work seems, somehow, to be influenced by the staid air of respectability that alway shovers around the venerable piie. Portraits of the Bishop of Lincoln, the new prelate of Truro, his Grace of York, the Dean of Ripon, and other eminent clergy, are notable pictures in the studio. In bright contrast to these somewhat lugubrious studies is a picture of "Early Summer," one of the first of Mr. Slingsby's compositions, which was engraved in the *Illustrated London News* the very day that the first number of the *Graphic* appeared. Here is our host as King Henry VIII., and a comrade, M. Lafosse, of Manchester, attired as a cavalier. Here are opals. Mr. Slingsby does not employ the transfer process, but coats his opals direct with collodion, worked up with exquisite taste by our friend himself; for Mr. Slingsby is a water colour painter of some note, as excellent examples here testify, a circumstance that accounts very clearly for the success that has attended his efforts in photographic compositions.

Further on, we come to some very fine heads produced direct in the camera, which have already been shown in the Crawshay competition, where they secured the artist a handsome money prize. Beside them, is a forcible

sepia sketch of an election scene in Lincoln in the good old time when Colonel Sibthorpe was the popular member; it is full of life and bustle, the foreground being occupied by the burly form of a local agent who had the character, we are assured, of being the best "briber and corruptor" in Lincolnshire. Mr. Slingsby sets great store on the picture, for it was executed years ago by Rejlander when he first came to England; and later on, when our host acts as guide up the steep narrow street that leads to the cathedral, he points out an ancient overhanging dwelling, with black oak beams about it, of which there are many in the quaint nooks and corners of the old-fashioned Close, where poor O. G. R. lodged during his sojourn in the city.

Mr. Slingsby has established a very good rule in regard to his visitors. He has two studios; they are on the same floor, and divided only by a laboratory. One—the further and larger one—is marked "Mr. Slingsby's Studio;" the other, "No. 2 studio." In the first, our host himself is to be found; in the other, an assistant rules. In a city like Lincoln there is, naturally enough, a good deal of second-class work to be done, "and there is no reason," says Mr. Slingsby, "why I should send sitters away." Everybody in Lincoln cannot afford to pay high prices; the second studio, therefore, suits a large number of customers, while those who desire the services of Mr. Slingsby himself are, of course, called upon to pay for them. All proofs are sent out untoned. "It has taken several years to educate our customers to untoned prints," said our friend, "but that is now our invariable rule." The advantages of such a rule are so obvious that it is a wonder all photographers do not adopt it.

Panel or promenade portraits are the "new style" in Mr. Slingsby's studio, who has deemed it worth his while to "go in" for a new lens expressly for them—the 3A Dallmeyer, an instrument that requires an interval of from sixteen to eighteen feet between camera and sitter. The principal studio is built on his own model; it has a northerly aspect, measures forty feet in length, and is glazed with transparent glass. The roof is steep, the

centre being sharply depressed, as if a huge notch had been cut into it, a plan, we believe, that Mr. Slingsby originally patented. In this way rather more front light is thrown upon the sitter, whether he is posed at one end of the room or the other. Mr. Slingsby has an arrangement whereby white linen blinds can be drawn over one part or other of his glass roof, but he prefers to work with large squares of bare glass, and then bring close to the sitter a gauze screen, or, rather, a frame over which fine muslin is stretched. These screens, which are about three feet broad, take the roof form of the studio; that is to say, they consist of an upright frame about eight feet in height, and another frame above, bending inwards with the line of the roof, measuring another three or four feet. They are obviously very practical, for they can be placed close to or far away from the sitter at will, and thus modify the illumination Mr. Slingsby believes much in the mobility of screens and backgrounds. The latter he stretches on frames, but does not fix. He prefers to be able to adjust them as he pleases, and, by inclining them slightly towards or against the light, to modify their character. You can get all sorts of backgrounds and accessories, but choosing them is a difficult matter. Photographers frequently overdo it by selecting backgrounds of too florid a character, with far too much park and ornamental waters about them; while accessories—whether balconies, balustrades, columns, or pedestals—appear usually too smooth and finely-finished in the picture. Mr. Slingsby has made a very happy selection, to judge from the subdued results in his pictures, and, although he employs aids of this kind without stint, they have none of that superfine brand-new appearance which, it may be remembered, was a feature of the Veneering household described in *Our Mutual Friend.*

We need say little of the laboratory except that it is one of the lightest dark rooms we have ever entered. For the purpose of adapting it to gelatine work, Mr. Slingsby employs a screen made of two thicknesses of deep ruby tissue paper stained with aurine. The hyposulphite bath for fixing is very conveniently stowed away: a handy counter is at the right hand of the window, which serves to rest plates or developing dishes upon; and when a plate is to be fixed, a flap door in this counter is lifted, the plate lowered into the bath, and the trap shut down again. Mr. Slingsby has also several cupboards with drop doors, which are exceedingly handy for putting plates temporarily away from the light in these days of gelatine work. The ordinary table drawer is a very inconvenient thing for a hiding place, as everybody knows. "We must have better means of getting intensity in our plates, though," says Mr. Slingsby, "if we are to work gelatine regularly for portraiture."

In the printing room, among other work, we saw the four big frames required for the printing of "Alone." The negatives are stopped out with ordinary black varnish. No. 1 pressure frame contains the portrait negative cemented fast to a twenty-four inch glass plate; No. 2 has the foreground similarly cemented down, which really consists of two negatives; No. 3 has the white sandhills; and No. 4 the sky. The last requires the most attention, and is the only one that calls for our host's personal care. "Ready for a change, sir," sings out the printer, when the turn of No. 4 frame comes, and then the delicate task of printing in the sky has to be performed by the principal. It was the foreground of this picture, however, that gave Mr. Slingsby most anxiety when it was taken, for two cartloads of stones had to be carried to the foot of the sandhills in order to break the line of the view.

We were privileged to see the commencement of another composition on which Mr. Slingsby is engaged, a standing female figure of much grace, which is to form the main feature of the picture; for picture-making has proved itself too lucrative a pursuit in our host's hands to permit it to be disregarded. If Lincoln does not sufficiently appreciate talent of this nature, Mr. Slingsby's merits are thoroughly recognized elsewhere. As a portraitist, however, his fame is, naturally enough, firmly established in the county, and our readers may not feel so very much surprise when we mention that Mr. Slingsby has sitters who

deem it worth their while to attend his studio from London, leaving town by an early train, and returning in the evening.

The "At Home" next week will be "Mr. P. M. Laws at Newcastle-on-Tyne—Photography by Gaslight."

AIDS TO THE WORKING OF THE GELATINO-BROMIDE PROCESS: OR, CURES FOR FOGGING AND FRILLING.

BY CAPT. W. DE W. ABNEY, R.E., F.R.S.*

I wish, in my short paper to-night, to bring to the notice of the Society three points which it seems should be of use in that fascinating, but still imperfect process the gelatino-bromide process. The first is regarding foggy plates and foggy emulsion. Now foggy plates may be due to foggy emulsion, and the latter may be due to one or two causes; either through making use of improper light in its preparation, through an alkaline reaction of the gelatine, through prolonged cooking or boiling, through an excess of silver, or through the use of ammnoia in its preparation. Foggy plates may of course be due to exposure to light, accidental or otherwise, The question arises, can the fog in all these cases be eliminated? Now there would be no need to answer this question at all if (may I be pardoned for saying it?) photographers would occasionally read dry matter. This they object to do, as a rule, and consequently often miss a point which might be of use. Among the dry matter which has been skipped, or we should have heard of it before, is a paper I read two years ago, on the "Destruction of the Photographic Image, and on the Elimination of Fog from Collodio-Bromide Plates." I should not have referred to this probably now, had I not come across several persons who did not seem to know how to utilise gelatine plates, and emulsion which veiled strongly or lightly, it matters not which. In my previous papers I pointed out how nitric acids, permanganate of potash, hydroxyl ozone, potassium bichromate, &c., would eliminate fog, and also destroy the undeveloped photographic image in collodion plates, and I have to once more revert to these oxidising agents. Now all acids (unless a precaution be taken which I shall point out presently) are out of the question for using with gelatine. Permanganate is effective for destroying fog, but it stains the film yellow†; hydroxyl, or peroxide of hydrogen, attacks the gelatine, and not the silver salt, and therefore is useless, but bichromate of potash remains, and this is an effectual eliminator of fog, or a destroyer of the photographic image. If then an emulsion is fog producing, squeeze it through coarse canvas into water containing two or three grains to the ounce of bichromate, and allow it to rest there four or five hours, and then wash it for an hour or more. The plates prepared with such a treated emulsion will be free from fog, and lose no sensitiveness.

Plates, whether exposed or merely foggy, yield to the same treatment, and give pictures which are bright in the shadows and wonderfully brilliant. If the bichromate be not washed out, the plates will lose about one-third of their sensitiveness and not more, since the bichromate is inactive in a dry state when not absolutely exposed to light. No emulsion now need be discarded on account of foggy plates being produced by it. I have prepared a whole batch of plates from such an emulsion, and used them, and found them as good as any plates that can be made. Some gentlemen, I believe, prepare plates which fog in red light, but not in the dark, and the coating must be a nuisance under such circumstances. If they will take my advice they will coat them in red light, when dried immerse them in bichromate and wash the bichromate out in the dark (though the better plan is certainly to make emulsions which do not fog in reasonable light). Their troubles will then end, since development in the dark is easy, as a plate will not fog in subdued light when once the developing action is set up.

It has been my custom to throw away plates that frill; I shall do so no longer, because there is a remedy for frilling which is an absolute certainty, as far as my own experience goes. It is simple in the extreme: before developing, coat the film with plain collodion, wash under the tap till greasiness disappears, and develop as usual. The image comes out just as well as without the film, and there is an utter mipossibility, as far as I know, for frilling to take place. I was led to the discovery by attempting to intensify half a plate, after fixing and drying, by coating it with collodion emulsion, and then using the alkaline developer. The part of the film that was coated remained firmly on the plate, the other frilled off in a most aggravating form: other experiments confirmed me in this, and I now offer my experience for the benefit of my brethren. It will now be seen that dilute acid may be used to clear plates from fog, if they be first coated with collodion. I trust that I have shown that neither foggy plates nor frilling plates should be consigned to the waste tub, and thus an economy has been introduced.

Another wrinkle is, that sulphate of quinine may prove a substitute for chrome-alum—a mere trace of it renders the film totally insoluble. Whether it will be of value or not remains to be proved.

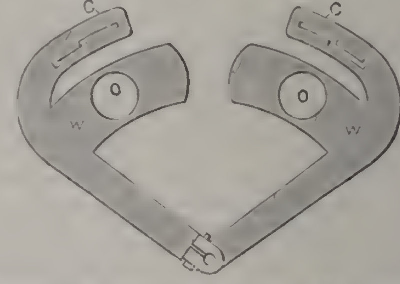
* Read before the Photographic Society of Great Britain.

† The yellowness can be got rid of by washing, after fixing, with dilute hydrochloric acid.

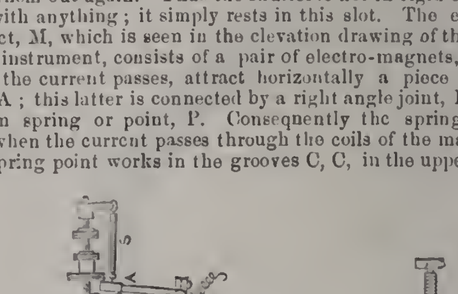
THE ELECTRIC SHUTTER.

BY MR. H. DARWIN.

The electric shutter designed by Mr. H. Darwin consists of two parts; first the shutter itself, that is the arrangement for opening and closing the lens; and, secondly, the electro-magnet. The shutter consists of two arms of flat steel, W, W,



which turn about a common axis, and which are joined together by a spiral spring, S', wound round that axis. A separate drawing is given of this part, which shows the shape of the openings which are cut in these arms. Just behind the slot, for the stops, another slot is cut right through the lens, L; through this slot these arms are pushed past one another, the spring tending to force them out again. Thus the shutter is not in rigid connection with anything; it simply rests in this slot. The electro-magnet, M, which is seen in the elevation drawing of the complete instrument, consists of a pair of electro-magnets, which, when the current passes, attract horizontally a piece of soft iron, A; this latter is connected by a right angle joint, H, with a thin spring or point, P. Consequently the spring point falls when the current passes through the coils of the magnets; this spring point works in the grooves C, C, in the upper parts



of the shutter, which come above the lens. When the shutter is set, the two arms are forced together, and the spring point working in the grooves, rises into the two little catches, which overlap one another in this position, but which are seen at the ends furthest apart of the grooves in the left hand drawing. The lens is then closed, as the holes in the arms do not overlap one another in that position; but when the current passes, the spring point is forced down into the free part of the groove, and the arms being thus released, the spring forces them across one another until the two round openings O, O, come exactly opposite each other at the centre of the lens. At this point, when the lens is fully open, the spring point catches in the

angles in the grooves, and the arms can go no further. The shake or jar is taken by the shutter, the spring point not being rigid enough to communicate the vibration to the camera. When the current ceases to pass, the spring point rises into the other part of the groove, and the arms pass past each other so as to close the lens. Thus the exposure is just as long or as short as electric contact is made. A pneumatic arrangement could easily be substituted for the electro-magnet.

NOTE ON THE OXY-HYDROGEN LIGHT.

BY REV. T. F. HARDWICH.*

The discussion at your last meeting will, I fear, go far towards neutralizing the effect of my paper. Nevertheless the fact remains that I have used the oxyhydrogen lime-light for years, and in rooms crammed with people, without the slighest accident of any kind.

May I ask Mr. Cadett whether he is in the habit of washing the oxygen gas in a solution of carbonate of soda before collecting it in the bag? I myself always do so very carefully, and the result is that my oxygen bag, although an old one, is quite free from the white powder alluded to by Mr. Bolas and other speakers. Two purifiers should be used, with a quarter of a pound of common washing soda to the pint of water in each, the end of the delivery pipe being plugged in the second, and afterwards drilled with five or six small holes of about one-tenth of an inch in diameter. After ten or twelve lectures, change the solution and put in fresh soda. The quantity of chlorine in the oxygen will be less if you prepare the gas at a low temperature, and avoid heating the retort red hot at the close of the operation. I have never seen the white powder complained of, but the description of it reads suspiciously like the powdery pyroxyline made by acting on cotton with weak nitric acid. Is it possible that an oxide of nitrogen or of chlorine may come off with the oxygen in small quantities, and, if not eliminated, may form some unstable combination with the calico lining of the bag? I merely throw out this as a suggestion, not being able in any other way to account for Mr. Cadett's explosion. It appears that he was using a safety-jet, with one bag only, and that the oxygen passed through water before reaching the burner.

Would it not be worth while to collect some of this white powder, found in old oxygen bags, and hand it over to Mr. Spiller for analysis? I have a very pleasant recollection of Mr. Spiller's name some twenty-five years ago, in the earlier days of photography, and I am sure he would not object to the trouble.

It gave me much pleasure to see Mr. Newton on the list of speakers, although I could not agree with some of his remarks. Curiously enough, I gave my first lecture twelve years ago with a lantern of his construction, and I saw at once that I had a valuable instrument for enabling me to get a hold on my people. Such being the case, I had nothing to do but to learn how to use it, and to take those precautions which common sense suggested. Amongst other things, I always appoint a friend to have charge of the gas-bags, and to see that no one comes near to touch them during the lecture.

Latterly I have departed somewhat from the mode of working which Mr. Newton advises in his remarks, and, instead of loading the bags heavily and contracting the orifice of the jet, have enlarged the orifice and lessened the weight on the bags. This must necessarily facilitate the passage of the gases in the right direction, and lessen the risk of explosion. The burner which I laid on the table at your last meeting does not admit of any coal-gas passing back into the wrong bag, for by unscrewing the nozzle you will see that a second nipple inside the first is pierced with eight very minute holes, through which the oxygen enters the mixing chamber. I lay very little stress, however, on this precaution, and have no more fear of a diffusion of the two gases whilst I am lecturing than I should have of shooting myself if I were to take up a gun. Some other explanation must be sought of the strange, and, to me, inexplicable accidents referred to by Mr. Newton.

The remark at the close of my paper on the paucity of lantern slides had reference to the class of subjects likely to be required for moral and religious teaching. I wrote to Mr. F. York, of Notting Hill, upon this subject some time since, and he applied to Messrs. Virtue for permission to copy their valuable collection of Scripture engravings, but I am sorry to say they were not willing. I hope they will reconsider the subject, and see that it would be to their advantage to do so. I must thank Mr. York for his zeal in bringing out so complete a list of hymns, more than three hundred in all, as the singing of hymns is one of the great attractions in these lectures. I do not despair of seeing the lantern more generally used than it is at present, if the name can be changed, and the causes of failure clearly explained. Thirty years ago the best photographers were never sure of getting a picture, but by patience and perseverance the weak points were discovered one by one, and what a different state of things prevails now! It will be the same with the optical lantern if those who have time and talent will take it up.

* *Communicated to the Photographic Society.*

ROYAL CORNWALL POLYTECHNIC SOCIETY.

The following are the regulations for competition, &c., for medals and prizes offered in connection with the Exhibition, to be opened on Tuesday, August 31st, so far as photography is concerned:

Photography.—In all cases state whether the work is professional or amateur, and name process of production.

All works sent for competition must have been executed within eighteen months of the date of this exhibition.

Carte-de-visite portraits are excluded from exhibition except when illustrating some special process or novelty.

Professional Photographers.—Medals are offered by the Society for meritorious productions in the following subjects;—(1) For landscapes; (2) for portraits; (3) for portraits untouched; (4) for composition pictures; (5) for instantaneous pictures; (6) for dry plate pictures; (7) for pictures by improved processes; (8) for enlargements.

Amateurs.—Medals are offered for meritorious productions in this department.

Photographic Appliances.—Medals are offered for improved apparatus and appliances, including magic lantern work. All exhibits in this department must be accompanied by a written explanation of their specialties.

Information respecting the Society and the Exhibition and forms to be filled up by the exhibitors, may be obtained from the Secretary, Edward Kitto, Polytechnic Hall, Falmouth. Information respecting the Art Union may be obtained from the Honorary Secretary, R. J. Bevil Sharpe, Falmouth.

Information respecting the photographic department may also be obtained from Mr. W. Brooks, Warren Road, Reigate, who has kindly undertaken to assist the Society.

Balloon Photography.—The success achieved by M. Paul Desmarets in his balloon photographs, to which we referred last week, has created some sensation in the scientific world of Paris. The photographs obtained by him at Rouen were exhibited and explained by M. de Fonvielle in a lecture delivered at Versailles Mairie on June 22, at a sitting of the Societe des Sciences Naturelles. They have been presented by MM. Paul Desmarets and Jovis to the Minister of War; M. Janssen will present them at the Academy of Sciences, and M. W. de Fonvielle to the Geographical Society. One of the photographs will be published next Saturday in the Monde Illustre, having been photographed on wood and engraved. The electrical apparatus which enabled M. Paul Desmarets to obtain his clichés, and the obturators have a weight of 700 grammes only, including the elements required. Steps are being taken for the systematic photographing of Paris and vicinity. One plate shows a piece of land covered with houses, gardens, and roads in the vicinity of Rouen, measuring 300 yards by 300 yards, and executed on the scale of 1-800. The altitude was about 1,100 metres. The second photograph was in the direction of W.N.W. facing the horizon. All the Seine, from Rouen Railway Bridge to Guellehœuf, is seen with wonderful distinctness. The city of Rouen was concealed by a dense cloud, and is lost in darkness The details on the banks can be magnified and examined at leisure. This remarkable ascent was made from Rouen on June 14, with Gabriel, a new balloon of 1,200 cubic metres belonging to M. Tovis, and built for the express purpose of crossing the Channel, weather permitting. It is owing to the uncertainty of the weather that this enterprise, of which we have spoken already, has been postponed.—*Nature.*

The Photographic News.

Vol. XXIV, No. 1140.—JULY 9, 1880.

CONTENTS.

STORED-UP LIGHT AS A SOURCE OF FOGGING.

More than two hundred and fifty years ago a shoemaker of Bologna made the curious observation that if barium sulphide, which he obtained by the reduction of the sulphate, was exposed to sunlight for a short time and then taken into a dark-room it evolved a considerable amount of light. After the barium sulphide had ceased to shine in the dark, it could be recharged with light by a renewed exposure to the sun's rays, or even to diffused daylight. Subsequent investigations have shown that very many substances have the above-mentioned remarkable property of absorbing light, and giving it out in a modified condition after the exciting cause has ceased. This phenomenon of light-storing is known to physicists as phosphorescence; and the number of substances possessing it in a low degree is very large.

Many years after the discovery made by the Bolognian shoemaker, Canton found that an extremely powerful light magnet or phosphorus, as he termed it, might be obtained by the calcination of oyster shells with sulphur. The impure calcium sulphide thus obtained was found to emit so much light after insolation, or exposure to the sun's rays, that the light evolved from a small lump of it enabled one to see the time by a watch; and the luminosity of the insolated calcium sulphide often lasted as long as ten or twelve hours.

Daguerre was very successful in the preparation of Canton's phosphorus, and published details of manipulation which rendered the production of an exceedingly phosphorescent product a matter of ease and tolerable certainty. He also studied the photographic properties of the phosphorescent light, and found that it acted energetically on the sensitive Daguerreotype plate, just as is the case with ordinary solar light. Experiments of an analogous nature were undertaken by Niépce de St. Victor, but although his results are of the greatest interest from a scientific and theoretical point of view, they do not appear to have led to any practical applications of phosphorescent light in connection with the photographic art. The experiments of more recent investigators prove that phosphorescence is generally excited by the violet and ultra violet rays, while the emitted light is always, or almost always, of a lower degree of refrangibility, and consequently of a more feeble actinic power. As regards the colour of the emitted light, various tints of blue, green, orange, and yellow prevail, the same body often giving different tints of light in accordance with slight variations in the details of its preparation.

It is a remarkable fact that the evolution of light by phosphorescent bodies may be very rapidly brought to a termination by their exposure to the least refrangible rays of the spectrum, such as the red rays; and some remarkable results, founded on this circumstance, have recently been obtained by Lieutenant Darwin, and by Mr. Warnerke; but as the experiments of these investigators have been recently described in the Photographic News, it is unnecessary to enter into details at present; more especially as our object is to point out that the absorption of light by many substances having only feeble phosphorescent properties, and the subsequent evolution of this light, may lead to fogging in the case of the extraordinarily sensitive gelatino-bromide plates which are so extensively employed at the present time. Many of the most successful workers with the gelatine emulsion process fully recognize the fact that it is very undesirable to admit a full flood of white light into the dark room immediately before darkening this apartment for the manipulation of sensitive plates, and we have heard of numerous instances in which plates have fogged after having been placed in proximity with white or light-coloured objects recently exposed to the action of a powerful light.

It is interesting to note that most phosphorescent bodies are light-coloured, so that little mischief need be apprehended from the approximation of dark-coloured bodies to sensitive surfaces, even though the dark-coloured bodies may have been quite recently exposed to the action of direct sunshine.

In order to obtain some definite ideas as to the extent of the danger above referred to, we made a few experiments with some feebly phosphorescent bodies more or less likely to be met with in the dark room, or to be brought into immediate proximity with sensitive films. Among these may be mentioned the diamond, chalk, lime, plaster of Paris, chloride of calcium, tartaric acid, sugar, silk, and paper.

Two glaziers' diamonds were exposed for a few minutes to sunshine, and were then placed, crystal downwards, on the face of a gelatino-bromide plate. They were allowed to remain for ten minutes, red light being excluded during this time. On developing the plate it was found that one diamond had made an impression on the film, while the other one had produced no apparent effect. The experiment was repeated with a piece of thin glass between the crystals and the film, and a similar result was obtained. In this case the phosphorescent diamond had a slight yellow tint, while the non-phosphorescent one was colourless. The phosphorescent diamond was again exposed to sun-light, and shut up in a dark box for one minute: being now placed on a gelatine plate, and allowed to remain for ten minutes, it was found that an impression could be developed by the application of an energetic developer. It was again similarly exposed to sunlight, but, instead of being placed in a dark box for one minute, it was exposed to the radiations of a red lamp for a similar period. After this it was placed in contact with a sensitive film as before, but in this instance no trace of an impression was revealed on applying the developer. In this case, then, it is evident that the red light extinguished the phosphorescence of the diamond during the minute of time during which it was allowed to act.

In order to test the phosphorescent power of chalk, lime, plaster of Paris, chloride of calcium, and sugar, a kind of rough negative was prepared by gumming two strips of black paper, in the form of a cross, on a glass plate. This being placed, paper side upwards, on a gelatine plate, the insolated substance was piled upon the paper cross. In each case some slight effect was produced, provided that the phosphorescent material had been sufficiently moved and stirred about during exposure to sunlight to saturate every part of it with light. In the case of one sample of plaster of Paris the phosphorescence was very energetic, a distinct impression being produced by allowing it to remain one second on the paper cross; while in the case of the chloride of calcium and sugar only an extremely feeble image was produced, even by an exposure of ten minutes.

We also tried the effect of covering the paper cross with each of the above-mentioned substances, and then allowing red light, from an ordinary non-actinic lantern, to shine on the under-surface of the plate, and it proved that five

minutes' exposure to this light was sufficient to extinguish the phosphorescence of either one of them.

Now, as regards white paper and silk, the results were very various, but no sample of either of these displayed so much phosphorescence as the specimen of plaster of Paris which we mentioned just now. No phosphorescence was noted unless the paper or silk was carefully dried, and even then it rapidly disappeared even in darkness, and almost instantly on exposure to red light. In order to test the matter thoroughly, a box was lined with a quality of white paper which had been found to possess some degree of phosphorescence; and the inside of this box, after having been carefully dried, was exposed to sunshine. The box being now rapidly removed into a perfectly dark room, a slide containing a plate was immediately introduced; and the shutter being half drawn the box was closed, and allowed to remain for five minutes. At the end of this time the developer was applied, and it was found that the half of the plate which had been exposed to the radiations of the paper was distinctly fogged. After the removal of the first plate, another slide containing a plate was introduced into the paper-lined box; but no trace of the action of light became visible on applying the developer.

A friend of ours having had his cellar newly white-washed, we obtained his permission to make the following experiments therein. In the first place, the cellar was carefully rendered perfectly light-tight, so that a gelatine plate might remain in it for hours without suffering any injury. We then burned about a quarter of an ounce of magnesium wire therein, taking care to well expose all the walls and corners thoroughly to the action of the light. It was now found that a plate was immediately fogged by exposure in the cellar, and it required a long exposure to the radiations of a ruby lamp to thoroughly restore the safe condition as regards gelatine plates.

In the instances above cited, we were working with substances of such feeble phosphorescent power that the emitted light was too weak to affect an eye of average sensibility; but it is highly probable that such powerfully phosphorescent bodies as Canton's phosphorus or Balmain's luminous paint will become of increasing interest to the photographer in other ways.

COLD EMULSIFICATION.

It may at first sight appear to be going backwards, instead of forwards, in the matter of emulsion-making, to call attention once more to the preparation of gelatino-bromide without the application of heat, or, at any rate, without the employment of a high temperature; but there is nevertheless a good deal to be said in favour of the earlier mode of proceeding. The boiling of the emulsion for half-an-hour or a little less, instead of allowing it to digest for several days, is such a wonderful innovation that none can afford to disregard it; and yet, as was pointed out in these columns last week by Mr. H. Bruyère, in some cases the older *modus operandi* is still preferable. The extreme simplicity of emulsifying cold on the one hand, and the risk of difficulties arising from overdoing it in the boiling operation, are considerations that will weigh with the photographer, and in cases where time is no object we must agree with Mr. Bruyère, that the method he advocates has much to recommend it.

The formula he prefers is a slightly altered one of Mawdsley. We have tried it, and the film is certainly a very satisfactory one. In our case the degree of sensitiveness was not particularly high, and the negatives were all the better for intensification, but a more easy plan of producing the gelatino-bromide can scarcely be conceived. The proportions are:—

Distilled water	4 ounces
Gum-arabic	120 grains
Ammonium bromide	80 ,,

The ammonium is simply put into a stoppered bottle, the water is added, and then the gum; a little shaking dissolves both gum and bromide. Afterwards 125 grains of nitrate of silver are dissolved in two ounces of water, and this solution put by degrees into the stoppered bottle, the latter being shaken from time to time; the operation is of course performed in the dark, and the whole business scarcely occupies half an hour.

There is really very little else to do. The emulsion should remain six days (we prefer seven or eight), and to guard it effectively from the light, it is well to enclose the bottle in a loose bag impervious to light. We like to employ one of waterproof material, into which the bottle fits loosely; there is no need then to guard it so jealously from the light, and it may be shaken at any time without fear of any damage from luminous rays. On the sixth or eighth day forty or fifty grains of gelatine are put into the bottle to soak, and half an hour afterwards the vessel may be put into warm water, to effect the solution of the gelatine.

Following the counsel of M. Bruyère, we did not wash the emulsion, but simply filtered, and coated our plates. The result was, as we have mentioned, a fine clear film, but not highly sensitive; for this reason it is that we recommend eight days' emulsification. Two films we washed, after they had set, but the only effect was apparently to reduce their sensitiveness.

Therefore we say cold emulsification is not likely to be forgotten yet awhile. To amateurs desirous of preparing their own plates the process is one that will highly commend itself, while even the professional photographer, if he can spare the time, will find that the older method possesses some important advantages. There is very little dark-room work, and the unpleasant operation of boiling in a close tenebrious locality, so trying to the eyes and head, is avoided altogether. The envelopment of the stoppered bottle in a dark bag permits one to work with more light than is possible under other circumstances.

Notes.

Photography has been employed with some success by Mr. W. N. Hartley, F.R.S.E., &c., in examining oils and turpentines to test their purity. He photographs the ultra-violet spectrum as seen through these liquids. He has examined in this way specimens of orange oil, French turpentine, and Russian turpentine, and was able by simply photographing their absorption spectra to detect cymene (a hydro-carbon akin to benzole) to the extent of 4 per cent. in the last-named liquid.

The South London Photographic Society intend to celebrate their coming of age, on the 24th inst., by a dinner to their popular President, the Rev. F. F. Statham, at the Holborn Restaurant. An announcement in our columns supplies particulars of the entertainment.

Mr. Woodbury's aerial photographic apparatus, which works by means of electric wires from below, is included in the Arctic Exhibition. The apparatus requires only a small balloon to lift it, and will take four successive pictures, on films forming four sides of a cube, which moves round at the will of the operator, who holds the electric wires attached. The uncapping and capping of the lens is also done by electricity from below.

At a recent meeting of the Berlin Association for the Promotion of Photography, Dr. Vogel exhibited his new emulsion, which, it is stated, combines the advantages of gelatine and collodion. No formula for its preparation was given, but those of the members present at the meeting who had tried it were loud in its praises. They found that in general it resembled a collodion emulsion, and that the manner of using it was similar to collodion, while, without all the care and precaution so necessary in flowing the latter, it gave a perfectly even and clear film.

Dr. Vogel himself claims for his new emulsion that it can be used either in a wet or dry state, the wet plates working slightly less rapid, but being more intense than the dry ones. Drying a plate after it had been coated could be effected in an hour. A photographer using this emulsion can easily prepare his own plates, and will find them to be as sensitive as gelatine plates obtained from the manufacturers, with the additional advantage that the operations of intensifying, fixing, washing, and drying are much facilitated. There can be no doubt that if all claimed for this new invention of Dr. Vogel's be true, it will become a formidable rival to gelatine emulsion.

Strange accounts come to us of the photographs in the Sydney Exhibition. They were so hid away in nooks and corners that they could not be found for inspection; "the defective arrangements," says the *Sydney Herald*, "arising from the overcrowded condition of the British Court, has necessitated many of the works of English photographers being hung on the walls of the staircases leading from the Garden Palace to the different galleries, where they suffer from want of subdued light." A Sydney correspondent adds:—"The judging of the different exhibits has been quite a farce, and has given great dissatisfaction. The commissioners, being limited for time, had to direct all their energies towards getting the building up, and the judges were not appointed until within two months of the closing. I could find only six of the twenty English exhibitors; where the others were stowed away, I could not discover."

We are glad to hear that the veteran photographer M. Poitevin is again in luck. The "prix du Marquess d'Argenteuil," of the value of 12,000 francs (£480), has been awarded him for his photographic discoveries. Poitevin, it may be remembered, received the Duc de Luynes' prize, which was even more valuable, some time ago. The same *Société Nationale d'Encouragement* gives a sum of fifteen hundred francs to M. Petit for his photo-type process, and a platinum medal to M. Chardon for his collodion emulsion process. In one of Byron's comedies, a dissolute old pauper exclaims, "Nobody never gives me no ornaments!" and photographers over here might say the same.

M. Pellet, we should mention, also comes in for a silver medal for his cyanofer process, or blue printing on a white ground. It is a medal well earned.

At the meeting of the French Academy on the 21st June last, M. Janssen, the Director of the Meudon Observatory, read a paper on the reversal of the photographic image by the prolongation of luminous action. After a certain time of exposure, he finds a less distinct negative image is obtained, and with continued exposure this image quite disappears, and a positive one is secured which may be quite as distinct as the first. This was the case, *e.g.*, in photographing the sun at Meudon, when plates that had been exposed 1-1,000th of a second, or even 1-20,000th of a second, (gelatino-bromide plates) were exposed half a second or a second. The sun's disk appeared white, the spots black. But surely it has not been reserved for M. Janssen to make this discovery!

Touching the washing of gelatine emulsion, Mr. Bolas has remarked that there is no necessity for this if the emulsion is applied to a plate already coated with ordinary gelatine; but this method of proceeding tends slightly to decrease the sensitiveness of the film.

Our Paris correspondent, M. Leon Vidal, has in the press a work on "Woodburytype—the Old and the New." It is to be published by Gautier Villars, and will be exclusively illustrated by the simplified process of Mr. Woodbury, which has already been so favourably received by Paris photographers.

Topics of the Day.

ON MOUNTING PHOTOGRAPHS.

BY PAYNE JENNINGS.

Next in importance to making a good photograph is the matter of properly mounting it. I do not, in this short communication, intend to treat upon the colour or tone of the mount—this is a matter that must be left entirely to individual taste, character of subject, &c.; nor shall I have anything to say as to the mounting of the every-day carte or cabinet pictures, as this is, I believe, an operation which is well and universally understood. But I wish to write as to the best method of mounting photographs on ordinary paper for book illustration, so as to be perfectly free from the very objectionable and but too well-known cockling of the mount, as this is, I believe, generally considered a rather difficult operation. It may, however, be successfully performed as follows. The rough untrimmed prints are first cured of their tendency to curl inwards by being placed face downwards on a pad of felt or other soft material; the thin edge of a paper-knife is then passed over the back of each print, pressing from the centre outwards; this will give the prints a fixed set, and they will, when placed together, remain perfectly flat without further trouble, and the prints are now in a nice condition for being carefully trimmed.

I am aware that this preliminary process of straightening the prints will to many readers seem unnecessary, but I can assure them that when once they have tried the method, they will ever after adopt it. It is done in a few minutes, and one is well repaid by the comfort and ease experienced in the subsequent operation. We will now suppose your prints and paper are dry and flat ready to hand, also a solution of freshly-made dextrine. Now take (say) a dozen of the sheets of paper, and with a moistened sponge damp the back of each sheet; then take up the first of the photographs, and having pasted the back with

dextrine, place on it the first of the damped sheets of paper.

Now rub down smoothly, and take the next one, and so on until you have the twelve mounted. Then take these twelve, and place separately between two stout sheets of millboard, such as used by book-binders. Now mount twelve others in a similar manner, repeating the operation until all are mounted and placed separately between successive layers of millboard. They are now to be left to dry, and when taken out will be found to be perfectly flat, and will remain so. As a final operation, and in order to give increased brilliancy and smoothness to the surface, they should now be hot-pressed, and are then ready for the binders. Of course every expert mounter knows that different qualities of paper require more or less damping previous to receiving the print. The whole secret of success, in fact, lies in the study of comparative expansion and contraction. A test trial is usually made with a fresh quality of paper, after which the mounting of thousands may be proceeded with in perfect safety.

A word now as to the mounting of albumenised prints upon glass so as to retain all the beauty and deliacy of a print fresh from the washing trough. First, you must be careful to print somewhat deeper than usual, in order to be sure you have all the detail out of the negative; also be careful not to overtone your prints. Now make a solution of gelatine one part to fifteen, and, having your prints ready, place them in a dish containing a weak solution of gelatine—say one to forty. Now take a plate of glass slightly larger than your print, warm it over a stove, and pour from a jug or other vessel sufficient of the thicker gelatine to cover the glass, spreading it over with a glass rod; then take a print from the dish, and with a rubber squeegee press the prints into optical with the glass, sponge off the surplus gelatine, and the operation is complete.

The "Topic" for next week will be "Collodion Transfer Enlargements," by Mr. George Bradforde.

FRENCH CORRESPONDENCE.

Great Extension in France of the Use of the Gelatino-Bromide Process—Further Improvement by Mr. Woodbury of his New Relief Printing Process—M. Janssen's Communication to the French Academy on the Reversal of the Photographic Image by the Prolongation of the Luminous Action.

The Gelatino-Bromide Process in France.—At the meeting of the Photographic Society of France, on the 2nd of July last, there was much talk about gelatino-bromide. I have already had occasion to record an increase in the number of those who have taken up this charming process; but the run on it which has recently occurred is still more remarkable; a very large proportion of French photographers now adopt it, and all who do so are enchanted with it. Formulæ for the preparation of developers, intensifiers, &c., are innumerable, and I am really careful before publishing any new ones. A large book could be made of all that has been said or written on this subject—one which has created a complete revolution in the art of negative photography by the substitution of gelatine for collodion. The investigations to which it gives rise, as well as the numerous variations which are published from day to day, are certainly a proof of the interest which the process excites. Of some of these I hope at a future time to give some account, in order to fix with certainty what can be done by a method which is at the same time simple and complete. At the present moment I am hardly in a position to say which method is the best, for every one claims special advantages for his own speciality, and every one thinks himself in the right; it is no easy matter to decide between the comparative merits of the work of such men as Captain Abney, Van Monckhoven, Dr. Eder, Mr. Carey Lea, Mr. Edwards, and Professor Vogel, to mention no others in Europe even. Confining our attention, however, to what is being done in France, I may notice the process of M. Stoerck, which is distinguished from others in general use by the fact that the solution of gelatine is in alcohol, which renders the emulsion both easy of desiccation and non-putrescent. His formula, which may be tried along with the others, to see if it really has any merit, is as follows:—In 1,000 grammes of water are dissolved, under non-actinic light, 30 grammes of ammonium bromide to which is added a solution of 45 parts of silver nitrate, dissolved in 500 parts or grammes of distilled water. The resulting silver bromide is washed for six hours in six different waters in order to remove the ammonium nitrate and any excess of ammonium bromide. Sufficient pure water is then added to make a quantity of 500 or 600 parts containing 5 parts of ammonium and 24 or 30 parts of neutral gelatine. The whole is next exposed for six hours over a water bath to a temperature of 35°C., and with the emulsion thus formed is mixed from 50 to 100 per cent. of its own volume of methylic alcohol. It is to the presence of the alcohol that the author attributes the qualities of non-putrescence and proneness to desiccation which he claims for his emulsion. What we now want to know is whether these claims can be established in practice. M. Bascher, a distinguished amateur at Nantes, read a paper at the meeting of the Photographic Society of France on his method of preparing gelatine pellicle, which varies very little from those which are generally worked. He mixes the two following solutions:—

(1.)

Water	250 grammes
Gelatine	30 ,,
Ammonium bromide ...	8 ,,
Zinc bromide	1 gramme

(2.)

Water	50 grammes
Silver nitrate	11 ,,

In order to have a very hard jelly he makes this mixture set over ice. He then cuts it up into small pieces, which, with the addition of water, he squeezes through a cloth, and thus collects the shreds which pass through the bag on a sieve. What remains on the sieve is plunged into alcohol, when the gelatine hardens to such an extent that, on stirring up the fragments, a noise is produced similar to that made by grains of sands in a similar case. This granular mass he places on a sheet of waxed glass and leaves it to dry. A slight movement of the hand is sufficient to sweep it off the glass, in form like a heap of pearls. The substance thus prepared can be kept, in the absence of light, for any length of time, and is used by dissolving it in the proportion of 10 grammes to 100 grammes of water.

The New Woodburytype Process.—Mr. Woodbury, when describing his new photoglyptic process, in which he substitutes a simple roller press for the hydraulic press in his old process, omitted to mention all the results which it gave him. One of them, especially, with which he has been lately occupied, appears to me to be worth noting. His new process, to sum it up briefly, consists in the following operations:—A positive proof on thick bichromated gelatine is developed on a glass plate to which it adheres. Into this positive in relief is pressed a sheet of tinfoil by means of the cylinder of a glazing press; this is then covered with a layer of copper by electrolysis, and the mould thus obtained is removed from the glass plate, and transferred to another plate with the coppered side in contact with the latter, thus leaving on the upper surface the mould in intaglio. To arrive at this result a negative is first employed. Now in his new method Mr. Woodbury employs a positive, from which a print is taken on the gelatine. By this means he simplifies the process considerably, for he can dispense not only with the operation of depositing the copper, but also with that of trans-

ferring the mould from one plate of glass to another. He confines himself to pressing the sheet foil against the relief, and thus obtains a negative with which he can immediately proceed to take a photoglyptic print. He has, in fact, the gelatine which served for the original relief in a backing of tinfoil. By this means he can produce two identical moulds, one by starting from a negative photograph by the series of operations above indicated, the other by starting from a positive photograph, from which a negative relief is taken, and the tinfoil pressed on to it. There may be cases where this method of working the process in two parallel lines, so to speak, may be able to render efficient service; it will therefore be of interest to repeat and to verify Mr. Woodbury's experiments, especially those on this later process, which may be considered to be an improvement on the one that he first devised. We can easily imagine circumstances when it may be easier and more simple to take at once a positive proof than to cover the back of a mould with copper by electrotyping. Again, there are cases where a transparent positive is alone available, and this might be at once taken advantage of for getting a Woodburytype mould by this new method. The different applications of photographic printing are now-a-days so varied and numerous, that every new method which can be worked on a large scale should be at once noted. All those methods especially are of interest which are founded on the mutual relations of a negative and a positive, two contrary elements, though part of the same whole, so that, taking advantage of each in its turn, we arrive at the same result.

Reversal of the Photograph Image.—This question brings us directly to a paper lately read by Mr. Janssen before the *Académie des Sciences*; it referred to the effect produced by the prolongation of the action of light in reversing the photographic image. The distinguished *savant*, whose astronomical researches are among the glories of this country, really thought that he had discovered something new. In the first one of his papers he says:—"I have the honour to bring before the Academy a discovery to which I have been led by my investigation of the solar spectrum and its photographic images." And this discovery, he goes on to say, is the reversal of the photographic image, in its change from a negative to a positive, by the continued action of the light which causes it. Now, from a digest of all the investigations on this point, already drawn up by M. Perrot de Chaumeux, it appears M. Janssen has discovered nothing new, except that he has found out for himself afresh what was already known to everyone conversant with photography. However that may be, the learned Academician is following up his so-called discovery, and there is much reason to hope that his farther researches may lead to an advance in our knowledge of the chemical action of light. LEON VIDAL.

Correspondence.

"GOUGALUM."

SIR,—Pray don't stare at the heading! Some two years or so ago I was retouching beside an American who used the preparation described by Mr. J. E. Walker in your issue of June 18th. I saw that my American friend turned a bottle upside down, and then with the stopper applied the solution to a piece of soft chamois-leather, which he afterwards lightly rubbed on the face of the negative to be retouched. I enquired what it was he used. "Waal," says he, "guess that's 'Gougalum;'" and "Gougalum" it has been ever since.

There are a few remarks I should like to make as a supplement, or appendix, to Mr. Walker's article. Last week I had occasion to retouch a negative which was so badly freckled that, after spending nearly an hour upon it, it was far from finished; so having held the negative to the fire until the retouching had the appearance of being under rather than upon the surface, I allowed it to cool, and then very carefully applied the "Gougalum" a second time, and finished my work. The surface seemed to have a better "tooth" after the second application.

Early in the spring I made up enough of the "medium" to last all the summer, by pounding as much resin as would fill an ordinary sized dessert spoon, and adding to one of Mawson's small iodizer bottles, which was nearly filled with turpentine. After it was dissolved (which took some time) and allowed to settle until next day, it was poured into a clean dry bottle. At this time the "Gougalum" was perfectly clear and bright, and about the colour of pale sherry; the weather also was fine and dry at the time; but on the first rainy day the mixture became turbid, and turned bright again as the sun appeared. This was repeated several times, but it is now clear as crystal. Perhaps some of your readers can explain the cause of this?

I use Barbe's leads, but prefer Faber's Nos. 2 and 3, being useful leads for retouching on the varnish.

Now that the light is so powerful, something to protect the eyes will be acceptable to retouchers with weak eyes. This is what I use:—Mix a little of Judson's *iodine green* with enough collodion to coat a plate, and apply it quickly. In varnishing, do not let the film dry, as it will become too opaque; so as soon as it is surface dry, pour on the varnish, and dry by heat. I place this in the front of the negative while retouching, and find it stops the glare wonderfully.

In the winter, on dull dark days, use a piece of opal glass, with the smooth side uppermost, as a reflector; it is much better than the looking-glass, as that only reflects the dull heavy sky.

Trusting that these remarks may be of use to some one, I am, yours faithfully,

AN OPERATOR OF SIXTY YEARS' STANDING.

A NEW STYLE OF PORTRAIT.

SIR,—Per book post I send a few examples of a new size of photograph I have just introduced, and called "The Malvern portrait."

I have been doing them about three months, and already the new size and shape have become quite an important item in my business, threatening to run out the cabinet for full and half-length single figures, and quite superseding the promenade or small panel.

There has always been the want felt of a shape that would allow of a full-length standing figure, without being obliged to use too many accessories to fill up the space.

The carte-de-visite was of the proper shape, but too small; the cabinet was large enough, but too broad. I venture to say the "Malvern portrait" has none of these objections, and, when properly brought under the notice of the public, will have all the popularity of the C.D.V.

The size is much more manageable than the promenade. In my own practice I take two on a plate, of the same size as I use for cabinets; they can then be printed either or both sizes. They can also be printed as C.D.V., and altogether are a lucrative size, easily and cheaply produced. Mounts for the same are purchaseable in the trade.—I am, sir, faithfully yours, NORMAN MAY.

Malvern, June 28th.

[Mr. Norman May sends us half a dozen examples of the "Malvern portrait," all of them pleasing pictures, and some exhibiting rare artistic treatment. The size of the print is 6 by 3½ inches, mounted like the Panel or Promenade, and we should have much to say in favour of its general adoption by photographers, if it were not that one format is quite enough to introduce at a time. When the Panel is more thoroughly established—and it has already taken firm root

both in this country and abroad—we should be happy to see the Malvern come into general favour. What the ca rt is to the cabinet, the Malvern is to the Panel.—Ed. P. N.]

REVERSED ACTION OF LIGHT.

Dear Sir,—After reading the article on "Reversed Action of Light" in last week's News, I may mention a case that occurred to a friend of mine the other day, who exposed a gelatino-bromide plate beneath a negative a few seconds, intending to get a transparent positive, but was surprised to find on development a negative perfect as original, but slightly less dense.—Yours truly, J. W.

URANIUM EMULSION.

Dear Sir,—Some years since I revived some of Colonel Wortley's uranium emulsion, that had gone into the same state as described by Capt. Turton in yours of the 2nd inst., by adding a little soluble chloride (either cobalt or calcium, I forget which) in a little alcohol; possibly this may assist that gentleman.—Yours truly, Richard Parr.

FIXING PRINTS.

Sir,—In the issue of May 28th "A Printer" complains of his prints having a metallic glitter attacking them; in the issue of June 18th C. J. Hopkins says boiling the bath is a remedy. The only remedy that I know of is to keep his fingers out of the hyposulphite solution, and away from the fixing dish, till he fixes his prints. "Printer" has been putting his fingers amongst the prints, or handling his fixing dish, or washing his prints in the same dish as he uses for washing the silver out of his prints.

When I first took to the black art, I had the same complaint. Took my prints to the firm I had the paper of; they could not tell me the cause of it, till I found it out myself by keeping the hyposulphite out of the way during printing and toning. I quite disagree with C. J. Hopkins about boiling the bath. He must be a very careless operator who allows anything but albumen to get into the bath, as a little kaolin or permanganate will rectify all that; and as to toning bath, if C. J. Hopkins will make up forty ounces of toning bath with the acetate of soda (or a gallon, if he is in a large way of business), and a stock solution, he will always have a toning bath ready for use. After he has toned his prints, return back to bottle; it will settle down, and be ready for use next day, about an hour before use. Add from a few drops to an ounce of stock solution, according to the number of prints he has. Filter the toning bath when it is getting rather dirty; a little kaolin or common whiting is best in my experience for the last eighteen years.

Make your hyposulphite solution two pounds to the gallon of water, and a quarter of a pound of carbonate of ammonia, and you will not be far from wrong.

A Countryman, and a Self-taught One.

"A CROWN OF GLORY."*

Sir,—Allow the plate to dry before fixing (in the dark, of course), then moisten and intensify with iron and citric acid (the same as wet plates). Wash and fix with cyanide; wash and intensify again, if necessary; but don't use any spirit. R. Hedges.

BURNISHER OR PRESS.

Sir,—Would some of your experienced correspondents tell me:—1. What is the best form of burnisher for a hardworking photographer—cheap and effective? 2. Are they really better than rolling or hot pressing? 3. What is the best medium for putting on before burnishing?—Faithfully yours, A Working Photographer.

* See page 305, Photographic News, June 25.

HOURS OF ASSISTANTS.

Dear Sir,—I have now been in business for twenty-five years, and I rarely change my operators and employés, so I suppose I may conclude that both they and myself are satisfied. I am always in the studio myself, so it is rare indeed that my principal operator is called upon to take pictures. But he has done so for weeks together sometimes, and done them well. I expect him to be with me at eight in the morning, or soon afterwards, and the two ladies who attend to the reception room, and do all the squaring, mounting, and spotting, come in about the same time. In summer time my second assistant, who is also the printer, comes sometimes at seven, but then I pay him extra. He has also to come for an hour on Sunday morning to change the prints, unless he can get a substitute, or make some other arrangements. All leave about six. I do not think this is hard work, and if you think this worth printing, you may do so.—Faithfully yours,

A Photographer who knows something of the Business.

N.B.—I should say that on Saturdays we generally close at four or half-past.

Proceedings of Societies.

French Photographic Society.

A meeting of this Society was held on the 4th ult., M. A. Martin in the chair.

A letter was first read by the Secretary from M. Laurent, of Madrid, giving a method of preparing gelatino-bromide plates so as to allow the emulsion to spread evenly over them. Upon the recommendation of M. Andra, he had employed water strongly sweetened with sugar, but found that the glass became too sticky to polish on the reverse side. M. Laurent's plan is to use hot water containing from two to two and a-half per cent. of sugar placed in a porcelain dish rather larger than the plate; the surface to be covered is then held over the steam for a moment. As the necessary quantity of emulsion is then poured on, an even film is obtained, while the other side of the glass remains perfectly clean. The steam being practically almost pure water, it has no chemical effect upon the emulsion.

M. Andra remarked that sugar was only employed to keep the surface of the glass damp, and that by wiping the plate with a wet cloth all stickiness will be removed.

M. Perrot de Chaumeux stated that Dr. Eder, in the preparation of gelatine plates, to avoid blisters, flaws, and frilling, washed the glass with a two per cent. solution of silicate of potash. The gelatine is then made to spread easily over the plate, and to adhere firmly to it.

M. Bardy, with M. Bordet, having used silicate of potash as recommended by Dr. Eder, said that he could not speak too highly of its results. Alcohol he found a useful medium in removing impure substances contained in the emulsion, but he had only used it after the gelatine had been washed for an hour or two in water, thus effecting a saving of alcohol. It is also found to be effectual in getting rid of transparent spots on the plates.

M. Andra stated that he had been experimenting in the direction indicated by Mr. Herschell. He found that by allowing water to flow evenly over the gelatine (in this case, ordinary gelatine), he obtained a plastic mass. He then tried the effect of acetic acid dissolved in alcohol in the porportion of forty per cent., and it proved successful in rendering the film hard, dry, very adherent, and perfectly resisting the action of cold water.

MM. Berthand, Cheron, Franck de Vilcholle, and Thomas, spoke favourably of M. Gilbert's retouching pencils.

M. Pector then said that the Society had been enriched by the presentation by the French Alpine Clubs of copies of their publications. He drew their attention particularly to the Annuals, the first dating from 1870, in which photography lent its aid for illustrating purposes. Among the maps worthy of attention those of Mont Perdu, Central Pyrenees, and the topographical chart of the range of Mont Selveux, were mentioned.

Besides the Annual, a quarterly Bulletin is published with the

view of establishing frequent and intimate relations between the centre and its provincial sections.

In October, 1879, the Alpine Club numbered 3,401 members which gives an idea of the importance of this Association.

M. Andra read a note on emulsion.

MM. Lhoste and Hikel exhibited a large number of negatives and prints, the former having been taken instantaneously by means of a guillotine shutter.

M. Guilleminot presented a new camera invented by M. Prudot.

M. Arentz gave a method of transferring collodion films.

M. Reynaud presented to the Society an instrument of his own invention, called a praxinoscope.

Talk in the Studio.

The Sydney Exhibition.—Mr. H. Manfield, of Northampton, writes that his agent in Sydnoy acquaints him with the fact that he has received an award of the 3rd order of merit, and that a similar announcement appears in the *Sydney Daily News.*

Obituary.—We regret to receive information from New Zealand of the death, on May 10th, at the age of forty-four, of Mr. Walter John Burton, of George Street, Dunedin.

Instantaneous Picture.—Mr. W. J. Chadwick, of Manchester, sends us a photograph of a sportsman shooting sea-fowl. It is taken by a shutter of Mr. Chadwick's own construction, which shows the smoke in the act of leaving the gun. The picture proves, according to Mr. Chadwick, that it is possible to expose *when you like*, a consummation devoutly to be wished.

York and Ainsty Hunt.—An interesting picture is on view at Mr. Bassano's, 25, Old Bond Street, subscribed for by the members of the hunt, as a testimonial to their late master, Col. Fairfax. It is executed by Mr. George Cooper, of Hornsea, Hull, and contains portraits of most of the leading members of the hunt. It is painted in monochrome with a view to its being reproduced, which has already been done by the Autotype Company, for distribution among the subscribers. The hounds might fairly have claimed a trifle more attention from the artist; but the portraits are, as a rule, excellent, while the grouping and the scene as a whole are most effective. Men and horses are remarkably free from the stiffness so often incidental to canvas rendering. Among the eighty likenesses, some of the most prominent and noticeable are those of Lord Wenlock, Sir George Wombwell, Col. and Mrs. Fairfax, Mrs. Jenvns, Capt. Slingsby (the present master), Sir H. Meysey-Thompson, &c.—*The Field.*

The Travelling Photographer.—The photographer often gets into good company. He may be fortunate enough to find a party at a country-house who take a fancy to be photographed in a lawn-tennis uniform or an archery costume. If he once gets admission to the great house he is sure of work for a day or two. All the guests will sit to him, singly or collectively. He will take groups on the lawn, groups in the porch, single pictures of the children. People in the country are generally glad of an excuse to break the monotony of existence, and there is a mild excitement even in the visit of a travelling photographer. After having fulfilled all the behests of the family upstairs, the travelling artist is sure of a brisk business among the maids below. Then it will occur to the clergyman than this is a good oportunity to secure photographs of the church and schools; and if the photographer be a sensible man, he will manage to get admission to the vicarage, and photograph the family there as well. He may also find occupation among the village shopkeepers, who, learning that "squire and parson" have sat to him, resolve to be in the fashion likewise. Of course, he may occasionally chance on places where neither squire nor parson will encourage him, but if he travels sufficiently off the beaten track, and knows how to play his cards properly, he can generally reckon on employment. A humble request to be allowed to photograph the outside of the church or the great house (which implies admiration of their beauties) will frequently secure more profitable work to the artist from the local ecclesiastical and secular authorities.—*The Globe.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

Hope.—Supposing it is not excess of iodide, which, from your description, appears unlikely, it is probably a matter of temperature. In warm weather a trouble of this kind is apt to occur. Keep down the temperature of bath and laboratory.

A Troubled One.—Your portions of negative not to hand; the Post Office not unfrequently stops glass as being against postal regulations. If your films are thin, you must invariably back them, to secure good negatives. See our leader last week. If your picture is good, thinness is of little importance, and Edwards' intensifier, which you use, should answer well.

R. B.—There should certainly be a market for your invention, if it is all you describe, and we think book-binders would take it up, if they saw it could be practically made use of. A firm will not look at it, however, until it is out of the domain of experiment. The specimens you send are certainly promising. The London Directory will give you the names of a score of binders.

K. K.—Rub over with finely-powdered graphite, and your difficulty will vanish.

Brighton.—It is not a question of hardness; all gelatines will run at a little over 90° F.

Woodburytype.—Mr. Woodbury is just now in Paris. His modification is both good and simple. Several of the Paris photographers have adopted his modified process. They pay, we believe, a thousand francs (£40) for the whole apparatus and instruction, and this you could obtain in Paris, if not here.

Oxalate.—Do not employ so much iron; you may use the bromide restrainer just as well as with pyrogallic development.

A. Z.—We do not know.

J. J. L.—1. Extra. 2. There is no necessity at all; you may put it into the developer at once.

J. Wilson.—Not without permission, and we may tell you that we do not think it will be accorded you.

Blackbird.—Wash your fingers in a solution of iodine in iodide of potassium, and then in a strong hyposulphite solution; finally rinse. Not at all.

Engraver.—You mean bichromate of potash or bichromate of ammonium. Use the first. Dissolve as much as you can in warm water, and decant liquid when cold; that will be a saturated solution.

J. C. Stephens.—Thank you for your note and information; also for the slips sent. We will write by post.

S. W. Oakes.—The medallion is very pleasing. As you say, the relief is objectionable for albums; but in Paris the public seem to prefer the "bonbon" effect, because of its finish. You hardly get the effect of relief in the oval; but, what is better, your mode of printing brings the portrait into relief, and in our eyes it stands out like a cameo. You can register for five shillings, we believe, but our Publishers will tell you more explicitly if you write them. But can you suit all portraits to the style? Your iron solution is a little too strong; hence the deposit.

W. Mackey.—Pyrogallic acid is freely soluble in alcohol, and such solution may be kept in good condition for any length of time, particularly if preserved in stoppered bottles. There is nothing to hinder the use of such solution in developing dry plates, beyond the well-known fact that strong alcohol precipitates alkaline bromides; but this objection could be got over by making, as you propose, a stock solution of alcoholic pyrogallic, and then mixing for use at the moment of development with a more diluted aqueous solution of bromide and ammonia. Weak spirit prevents frilling, destroys air-bubbles, and helps to make the developer flow evenly over the plate.

J. R.—Your position is truly a difficult one, but explain it frankly to anyone you apply to for a situation; your would-be employer, if he doubted your story, would apply to your late principal, and, if the latter were still silent, his silence would be good confirmation of your word.

Black Country.—We will make enquiries for you.

Cambria.—It might be made use of by adding to fresh collodion, but it is rather a precarious experiment; it is, however, your only chance, unless employed for plate cleaning. Experiment with a little at a time.

W. O.—We see no advantage in such a light. From your description, are we to imagine you work without using blinds?

James Clark.—You will find much information on photographic printing in the book you mention; but if you will say what it is you want to know, we might be able to give the desired information in this column.

A. V.—Received. Thanks.

Amateur.—They are photographs any one might be proud of.

The Photographic News, July 16, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Latest Woodburytype Method—The Thin Sheet Metal from which Bronze Powder is Manufactured—Naturalists and Photography—Mr. Dunmore's Prize Competition—The Dinner to Mr. Statham.

The Latest Woodburytype Method.—This process, which was alluded to by our Paris Correspondent last week, promises great things. What can be more simple than employing a positive transparency instead of a negative, and then actually using the gelatine relief itself as a printing mould? The keynote of the process, however, consists in covering the surface of the mould with a sheet of tinfoil, this being forced into every detail of the gelatine by pressure. Those who have not tried the experiment of moulding a finely detailed surface by means of tinfoil have no notion as to the ease with which this substance can be made to receive impressions of the most minute and finely modelled details. It is difficult to see in what respect a dry and hard gelatine relief, developed on a thick piece of plate glass, and rendered impervious to aqueous liquids by means of a covering of tinfoil, should be inferior, as regards printing qualities, to the usual lead mould. On the other hand, the new composite mould appears likely to possess many substantial advantages over the old-fashioned one. Instead of being soft and subject to damage or absolute ruin through careless handling or uneven pressure, the new moulds should be always ready for printing, and never go out of truth. The fact of dry insoluble gelatine being very much harder than lead will, no doubt, prove of great practical advantage, as a very large number of copies will doubtless be obtainable from one of the new moulds before any signs of extension of the highest points of light become visible in the prints; this extension being due to a flattening of the most prominent parts of the mould. This last simplification bids fair to be Mr. Woodbury's greatest triumph; more especially as we may now see the Woodburytype process in the hands of the many. Vidal's promised book on "Woodburytype—the Old and the New," will be waited for with impatience by those interested in photo-mechanical printing.

The Thin Sheet Metal from which Bronze Powder is Manufactured.—When wandering through the Printing Exhibition, now open at the Agricultural Hall, we caught sight of some of this material hanging around the exhibits of Messrs. Ehrmann and Co., bronze powder makers, of Fürth. These sheets are of brass, or a brass-like alloy, and about one-fourth the thickness of ordinary tinfoil; while they proved, on inspection, to be perfectly continuous, and free from holes. It is unnecessary to say that our thoughts were at once directed towards the "new" and the "newest" Woodburytype process, for which we hope that the material in question may prove useful; and although we were unable to secure a specimen of this thin sheet metal at the time, we hope to obtain some before long, and to try the result of using it as a substitute for tinfoil in Woodbury's new processes.

Naturalists and Photography.—The Epping Forest and County of Essex Naturalists' Field Club is a kind of outdoor society for discussing and studying the natural wonders of the county generally, and Epping Forest in particular; and last Saturday week they had a very enjoyable afternoon's ramble in the Forest, despite frequent showers of rain. Although about fifty attended the meeting, only one camera was visible, and the bearer of that appeared to be so dispirited by the general dampness of the occasion that he did not seem disposed to take much advantage of the occasional bursts of sunshine, which, like the wand of a magician, often changed the whole aspect of the scene, causing the leaves to glisten like—aye, more brilliantly than—the most diamond-bedizened beauty of the ball room. If some three or four members were to tell themselves systematically off for photographic duty, the Club would soon possess an interesting and permanent record of their wanderings; and the discussion of points of interest to the members—such as the identity of certain ridges of earth with the boundaries of ancient camps, the conditions of the growth of trees, &c.—might be discussed upon photographic evidence during winter evening meetings. Who, for example, would not like to have a life-sized photograph of that remarkable little plant, the Sundew, which closes in upon and digests small flies or other insects? And yet we have never heard that this curiosity of Epping Forest has been photographed.

Mr. Dunmore's Prize Competitions.—Some nine months ago the South London Photographic Society instituted, at the suggestion of Mr. Dunmore, a monthly competition in artistic photography, the subject for each picture being periodically announced from the President's chair. The first subject thus set for the competitors was "Winter," and no less than twelve pictures were sent in. The late severe weather certainly favoured the effective rendering of such a subject; but, considering that the competition is limited to members, the number of pictures sent in may be regarded as highly satisfactory, and indicative of a considerable degree of vitality on the part of the Society. Among the twelve pictures are several of which the merits are so considerable that the judges will have no easy task in awarding the palm; and there is not one out of the twelve which can in any way be considered as devoid of a high degree of merit. The more difficult subject of "An Election" having been set, four pictures were sent in; while the more extensively practicable task of making a photograph to correspond with the title "Desolate" was fulfilled by five aspirants for distinction. Among the subjects for future competition may be mentioned "Mischief," and "A Bit of Sunshine." At the October meeting of the Society we may hope to see numerous pictures illustrating these titles. The former especially affords a fine opportunity for fully developing the wonderful life-depicting power of rapid gelatine plates. We remember once witnessing a scene which would have well illustrated both subjects. A choir boy in a cathedral was singing his solo with a result evidently highly satisfactory to himself, while a beam of sunshine passing through the east window lighted his face and figure in a manner calculated to delight an artist. Meanwhile, a young rascal, who was standing next to the singer, was just in the act of inserting the point of a pin into the soloist's elbow. Retribution, however, came sharply upon the delinquent in the form of a severe cuff administered by a grisly-bearded man who was immediately behind our youthful friend. Mr. Dunmore deserves thanks for having inaugurated these friendly competitions; and let us hope that the discussions which an examination of the pictures must inevitably lead to, will be productive of improved artistic taste and increased enthusiasm in photographic matters.

The Dinner to Mr. Statham.—This dinner, which was announced in our last number, will not only celebrate the majority of the South London Photographic Society, but also the circumstance that the Rev. F. F. Statham has presided over it during the whole twenty-one years of its existence. The genial presence of Mr. Statham has been a real bond of union during this period, and slight discords, which have made themselves felt from time to time, have been so adroitly resolved by him, that the South London Society has always been noted for the harmony of its meetings and the good fellowship existing among its members. We hope to see a good attendance of members and others.

At Home.

MR. P. MAITLAND LAWS AT NEWCASTLE-ON-TYNE.—PHOTOGRAPHY BY GASLIGHT.

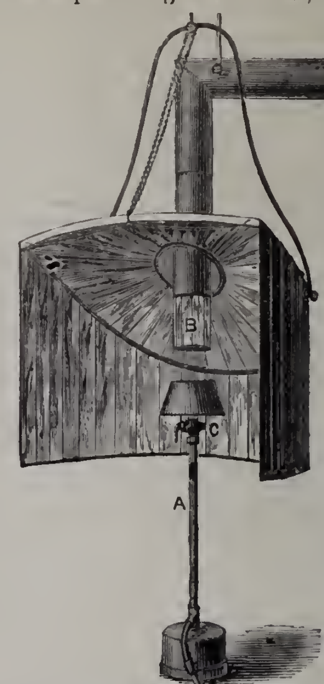
To visit Newcastle and not to see Mr. Laws' clever arrangement for taking portraits by gaslight would have been a mistake indeed, and even if we had been disposed to commit it, our good friend Mr. Swan would have made little ceremony about correcting us. "You must go to Mr. Laws' while you are here," said he, and he took care that we went. Perhaps we expected to see more, or perhaps the simplicity of the apparatus surprised us; but in any case, the impression on the mind, after you had been in the studio some minutes, was that you could go out again as soon as you liked, there being nothing to keep you. We once engaged in a terrible struggle of many minutes' duration, we remember, to get a peep at Garibaldi sitting in a carriage drawn up before one of the railway stations, and, hot and breathless, at last succeeded in pushing right into the front rank to look upon the famous patriot. He was bare-headed, and dressed in that well-known grey toga, a sight well worth seeing. But, after all, there was only a human face and some grey cloth to look upon, and you could not go on staring at these simple things for ever. So it was with Mr. Laws' gas apparatus; it seemed so simple, it was hardly worth coming to see. The gas burner is no novelty, and the dome-shaped reflector inside is of silvered glass like other reflectors; as the Cockney said of St. Peter's at Rome, it is well scooped out, but there's nothing in it.

The apparatus, nevertheless, represents the fruit of much hard work and ingenuity. Mr. Laws set himself a problem, and worked it out by himself. A year ago, taking portraits in the studio by gaslight in the ordinary way of business would have been laughed at as an extravagant idea. Walk into Mr. Laws' studio to-day, and the whole matter is so obvious, you are tempted to declare there is nothing in it at all. There is a gas flame, and there is a reflector—*voilà tout!* Mr. Laws might, however, be tempted to say, "Just so; *voilà tout!* a gas flame and a reflector; but no electric light, no gas engine, no Gramme machine, no complicated screens, no pyrotechnic display, no magnesium fumes, no sulphur and chlorate of potash, no puffs and no smoke, no mixing of anything in a mortar or winding up of any clockwork, and, above all, no patent; there is a gas light and there is a reflector, that is all." Mr. Laws deserves honourable recognition for having devised a plan of artificial illumination that is unsurpassed for efficiency and simplicity.

As to the nature and delicacy of the pictures produced by gaslight, we merely say that they are only second to those taken by the aid of the sun. Any of our readers who are interested would, no doubt, be welcome to an example from Mr. Laws by paying the nominal cost of the print, and we venture to say they will be unable to point out any great difference—if, indeed, any difference at all—between it and pictures taken by daylight; of course Mr. Laws prefers daylight, like anybody else, and only employs his gas lamp in the winter months and in dull weather. Unfortunately, the public are not of the same mind. "I saw none of your gas-light pictures in the reception room," we remarked. "No, I have been forced to remove them," said Mr. Laws; "everybody wanted to be taken by gas-light in the summer time."

One other remark before we describe the apparatus. The multiple gas flame is rather a large one, and it might be supposed that the Insurance Companies would therefore be inclined to augment the premium; but, notwithstanding the fact that an officer was sent to inspect the studio, no addition was made to Mr. Laws' charges on account of fire assurance.

Here is a sketch of the apparatus, which is placed at the side, and a little in advance of the sitter. We will begin with the burner. From the floor rises an upright pipe or standard, four feet six inches high, with burner at the top, A; over the burner is a chimney, the lower portion of which is of mica, B, a material transparent and unaffected by the heat of the flame. There is a tap for turning the gas on and off, C, when the exposure begins and ends; but so that the



flame, or rather flames, may not be entirely extinguished, there is a little bye-pipe which may always be left turned on. The burner is one of Wigham's, and consists of sixty-eight jets, capable of yielding an illuminating power, it is said, equal to 1,250 standard candles. The shape of the reflector may be said to be that of a Dutch oven, only it is doomed instead of angular. It is of galvanised iron, and lined throughout with strips of silvered glass. The upper concave portion of the reflector supplies top light, the lower parts side and front light. The reflector is suspended from the ceiling by an iron rod, and in such a manner that a slight touch is enough to swing it round and alter its position. The measurement of the reflector across the front is forty inches. When fixed for use, the top of the reflector in front is six feet from the floor, while the back (the reflector has a sloping and rounded roof, it must be borne in mind) is four feet three inches from the floor. In the centre of the roof of the reflector an opening eleven inches in diameter leaves room for the chimney. The walls of the reflector in front measure forty inches.

A burner and reflector of this kind near the sitter is a little unpleasant, both by reason of the heat and glare that are perceptible; but these disagreeable characteristics are at once shut off by a screen of blue glass that Mr. Laws adjusts to the front of the apparatus, and which is not shown in our cut. It is simply a frame measuring 40 inches by 40, filled up with strips of blue glass. This screen is quite sufficient to remove any unpleasantness, and the sitter, as we ourselves can testify, suffers no more from the light than he would in looking out of window. Strange to say, there is very little actinic power cut off by this blue screen, the exposure of a plate for eight seconds with the screen giving as good an image as one exposed for seven seconds without it. Eight seconds is the time fixed for a carte portrait with the extra sensitive gelatine plates of Mr. Swan, who has from the commencement taken great interest in Mr. Laws' work, and seconded his efforts in many ways. For cabinet portraits, twelve to fifteen seconds amply suffice.

Mr. Laws told us that Messrs. Edmondson, of London and

Dublin, have inspected his reflector, and are in a position to make others of a similar nature; but, as our readers will observe, there is nothing particularly difficult in the way of constructing the apparatus. Mr. Laws has tried naphthalising his gas in order to increase its brilliancy, but the results of his experiments in this direction show that there is little if anything to be gained by such means. We may mention, by the way, that according to the Act of Parliament, gas supplied in London should have an illuminating power of not less than sixteen sperm candles, employing a standard burner, and further, that per 100 cubic feet there should not be more than ten to twenty grains of sulphur, and not more than five to ten grains of ammonia. But in the provinces the standard is scarcely so good.

Mr. Laws speaks highly of gelatine plates for ordinary studio work. He has employed the silver bath scarcely at all this year, and does all his daily work with dry plates. He employs the oxalate developer, made up according to Eder's simple formula, and makes it a rule to expose no more than two plates on every sitter, so familiar has he become with their qualities. We have to thank Mr. Laws heartily for permitting us to see his very clever gas lamp, and for placing so freely at the disposal of our readers the experience and information he gained at the cost to himself of much labour and expense.

Next week the "At Home" will be "With a Peripatetic Photographer at St. Cloud."

THE OPTICAL LANTERN.

BY C. G. CUTCHEY.*

My paper this evening may seem at first sight a little out of season; but as the lantern is so much allied to photography I must plead that as my excuse. There is still a prejudice against the lantern by "children of an older growth," as a thing really only adapted to the amusement of the very young—a prejudice I cannot myself entertain, as it is, without doubt, an instrument not only of amusement, but of instruction.

I know it is the correct thing to put down every invention to an Englishman, so suppose I should not be in order unless I claimed the lantern as of English origin, Roger Bacon having the credit of its invention in the twelfth century. However, I think there can be little doubt that many of the (supposed) supernatural apparitions of the "dark ages" were the work of the lantern, and that the so-called "wizards" largely used it to aid them in their deceptions. But it was not wizards only who used it, for we read that a Sicilian priest produced phantom figures by it in the Amphitheatre of Rome, in the presence of Cellini, a Florentine engraver, who died in 1570. It was much improved by Kircher, a Jesuit, who describes it in his Latin work, entitled "*Ars Magna Lucis et Umbra.*" This lantern consisted of a wooden box, enclosing an oil lamp, having an opening in front for a tube containing the lens. It seems to have remained in this state for nearly three centuries, till Mr. Child, in 1811, publicly exhibited his invention of dissolving views. Up to this time the lantern may be described as simply a scientific toy, the illuminator still being an oil lamp.

The lime light was first used about 1831. About this time Messrs. Carpenter and Westley were fitting up the Bond Street Theatre in a most sumptuous manner for its extension; but in the meantime, Mr. Carey, of the Strand (who had just made a pair of lanterns for the Polytechnic Institution), took a large room in the Strand (opposite his premises), formerly used as a billiard room, and exhibited the lantern for the first time with the lime light. This light was afterwards used by the Polytechnic and similar institutions. It was then known as the "Drummond light," and had previously been employed for the microscope, but, of course, only in a small way, the gases being stored in bladders, several of which were connected together and a weighted board laid on them. Mr. Carey used glass bottles for the two gases; he employed the pure hydrogen.

Mr. Macintosh, the well-known waterproofer, now stepped in and undertook to make india-rubber bags sufficiently strong to hold the gas. The first bag was used one evening in the shop of Mr. Bates, an optician in the Poultry. It, however, burst, doing some considerable amount of damage to the shop. Mr. Mackintosh saw what was wanted, and afterwards produced a bag that would hold the gas and bear sufficient pressure to ensure a good, steady light.

I have now brought the lantern to a period coincident with the youth of most of us, and to a time when the word "magic" might almost be said to cease to be applied to it; still much was wanted to make the lantern perfect.

We all remember the immense popularity of the dissolving views at the Polytechnic, and how "country cousins" on a visit to London were taken to see them. Still, superior as they were to our earlier remembrances of the lantern, they did not come up to the mark, the views being very inefficient. But now stepped in our own black art, photography, and then, as if by magic, the whole was changed. I have been told by my friend, the late James How, in whose workshop many of the slides were prepared, that the excellence of the Polytechnic views was due to photography. The pictures were first outlined on a large canvas, and then photographed to the required size, and hand-painted. I cannot pass on without here alluding to the excellent hand-painted slides of Messrs. Newton, and the photographic slides by our respected member, Mr. F. York. Mr. Dancer, of Manchester, is credited with being the first to use photographic slides for the lantern, he having exhibited some of M. Ferrier's stereoscopic slides in Manchester.

I have now given a very rapid sketch of the history of the lantern, but a few words as to the name. It has long been felt that the term "magic lantern" was a misnomer, and it further carried with it thoughts of those abominable daubs, unworthy of the name of pictures, to which we were treated in our early days at all Sunday and other school treats, when a picture of a seaport would answer as well for Gravesend as Southampton, or, with little more expenditure of yellow and red, for some Eastern port. I remember once showing the lantern for a friend who had been a great traveller, and a hand-drawn slide was thrown on the screen, supposed to be a view of Alexandria. My friend seemed completely thrown out, and requested me to put on the view of Alexandria. Upon my telling him that I had done so, or, rather the picture sent for that place (one of a set of a "Tour Round the World"), he said—"Well, I suppose it must be so, as I see the lighthouse; but that is the only resemblance to the place." Well, to return to our subject. I think all who wish well to the lantern must feel indebted to Mr. Shadbolt, of Manchester, in suggesting that in future we should call it the "optical lantern." And now a few words as to the lantern itself.

I cannot agree with those gentlemen who advocate the indiscriminate use of the mixed jet, knowing full well the danger attending its use. Of course in large institutions like the Polytechnic it is absolutely necessary, as the pictures are thrown on the screen for a long distance; still, when a good, clear picture of fifteen or seventeen feet can be obtained by the blow-through or safety jet (as I have often been able to do), I see no need of running the risk of accidents by using the mixed gases, especially as the whole apparatus is, perhaps, placed in the midst of a large audience.

Mr. Cadett, the other night, in "another place," stated that he had been violently made acquainted with the ceiling of his drawing-room once, when using a blow-through jet, from an explosion of his oxygen bag. This seems to be a most unexplainable accident, as it seems next to impossible that the two gases could get mixed with a safety jet. Of course, with care, a mixed jet is safe enough; but it is as well to avoid a dangerous thing, as even such experienced lanternists as Mr. Malden sometimes have their assistants rather unexpectedly introduced to the audience through a hole in the screen. I find the "excelsior" limes the best limes I can get. They are hard, and I have frequently been able to use a lime twice. Then, as to the oxygen gas: I find that half a pound of oxide to one and three-quarter pound of chlorate a good mixture, and I always put an ounce (about) of bicarbonate of potash in the purifier. This throws down the chlorine, and so preserves the gas-bag. I always use the black bags; I find them more durable, though dearer at first. And now a word as to the care of the bags: always keep them, when not in use, in a warm, dry place; this keeps them supple.

I will not say much on the "optical" part of the lantern, that being in such good hands as those of Mr. Dallmeyer. I am, however, inclined to think that the portrait form of objective is a mistake, as the light has to pass through the back combi-

* Read before the South London Photographic Society.

nation or four skins and a cushion of air; then through a cushion of air to the front combination, two more skins; and so is much diluted. I have recently had an achromatic lens made for my lantern—that is, in fact, two front combinations placed close together—and I find that I get more light and perfect definition; and another advantage—especially of showing through the screen—I can get nearer the sheet; that is to say, I can get a ten-feet picture at about twelve feet, instead of at twenty feet with the portrait combination.

Now, a few words as to the slides, and, perhaps, that will bring me more in season. In these days of instantaneous gelatine plates, what photographer thinks of taking his summer trip without his camera? We all know how pleased—and I think I may say proud—we are to show our friends the "charming little bits," the "sea views," and shady nooks taken during our jaunt; and how delightful it is in the pleasant season of Christmas to show these said "bits" on the screen to our friends! Then, again, what delight, amusement, and instruction are given to our friends who, from various reasons, are "stay-at-homes"—how, in fact, our camera says—to slightly alter the Mahometan doctrine that "if the mountain will not come to Mahomet, Mahomet must go to the mountain," to—"If I cannot go to Ober-Ammergau, or Paris, or the Rhine, they must come to me;" and so they do, in all their beauty and in far greater perfection and truth than can possibly be done by any hand-drawing, however skilful the artist.

Now the making of slides by the wet process is very easy. I prefer a weak iron developer, intensified with pyrogallic and silver, and if a blacker colour be required, intensify with a little of your acetate toning bath; but do not forget to place your slide in hypo after intensifying. If your negative be a five-by-four or quarter-plate, first-class transparencies can be obtained by contact on a collodion emulsion plate, or a transparency by Mr. B. J. Edwards's modified albumen process is not by any means to be despised.

ROYAL CORNWALL POLYTECHNIC SOCIETY.

From the very carefully-prepared and well-executed volume forwarded us in the shape of the Forty-seventh Annual Report of this Society, we make some extracts, giving details of results we have already briefly chronicled.

The following remarks occur in the Report of the Committee:—

The high technical character of the exhibits in the Photographic Department was due, in great measure, to the carefully-revised list of awards prepared by the Judges in view of the rapid advancement recently made in the Photographic Art, and to the personal interest of Mr. W. Brooks, of Reigate, who kindly undertook to assist the Society in inducing artists to send their pictures to the gallery. Amongst the leading photographers who for the first time exhibited their works were Messrs. Wratten and Wainwright, Hill and Saunders, Payne Jennings, W. Willis, Jun., and J. S. Hazard. Mr. Willis exhibited some fine pictures by a new process—"the Platinotype." A special feature in this department was the collection of photographic appliances, which included some ingenious and elaborate apparatus.

Subjoined is the report of the judges, Messrs. R. Fox (chairman), W. Brooks, and G. Lanyon. The exhibition was, as will be seen, divided into the three sections, professional photography, amateur photography, and photographic appliances.

Although there is a slight falling off in the number of exhibits compared with last year's exhibition, the Judges are exceedingly pleased with the high technical excellence displayed, especially in the new dry plate processes, which seem to have come to the front during the past two or three years. The exhibits by the gelatine dry-plate process are most remarkable. Under the name of platinotype a new printing process has been introduced, combining permanency with simplicity. The Judges have great pleasure in congratulating the Society on the quality of the exhibits generally, if not on the number.

In Section 1 (Professional) for the best landscape in the exhibition there has been awarded to Mr. Payne-Jennings a first silver medal for a series of English and Irish scenery, No. 593, which, while possessing force and brilliancy, are extremely soft and delicate, and are of high artistic excellence. Messrs. Wratten and Wainwright are awarded a first silver medal for their instantaneous pictures, No. 625, of the University Boat Race, 1879, taken on gelatine emulsion plates. They are truly miraculous productions, and in two of the prints especially the river teems with life, and every wave is portrayed; the Judges consider them the most perfect examples of instantaneous photography ever exhibited. Mr. Willis, Jun., exhibits some very fine examples of portraits and views printed by his new platinotype process, which are permanent. Platinum is here used in place of the fugitive silver compounds. A second silver medal has been awarded to the process. For a frame of interiors a second silver medal is awarded to Mr. R. C. Lenthall, of Reigate, taken by the gelatine process. They are very excellent productions. In interiors it is generally noticed that violent contrasts predominate, which is not the case here. In the Portraiture Department the exhibits are very few, especially in large work. A first bronze medal has been awarded to Mr. W. Gilliard for a portrait study, No. 590, taken direct, which possesses some very excellent qualities. Messrs. Hill and Saunders, of London, send a frame of particularly fine examples of cabinet size, studies of children. The Judges consider them the finest examples of portraiture in the exhibition. As a rule, white draperies come out a meaningless white mass; but by the peculiarities of the gelatine process this defect is entirely overcome. A first bronze medal has been awarded to this exhibit. Mr. E. Greaves has also been awarded a first bronze medal for his studies from life. A second bronze medal is given to Messrs. Russell and Sons for a very fine group by the gelatine process. For an enlarged group, printed in carbon, of the members of the South London Photographic Society, by Mr. H. G. Cocking, a second bronze medal has been awarded. The Judges call special attention to some fine examples of portraiture taken at night by the Luxograph process, showing that a new sphere has been opened to this art. The specimens sent of a fancy dress ball are nearly, if not quite, equal to portraits taken by daylight. The Judges regret that, owing to some of the same pictures having been sent by two exhibitors, they were unable to make an award. Mr. Baker, of Birmingham, sends some examples of cabinet portraiture, which are very clear. Mr. H. G. Cocking also contributes three figures studies, but the Judges do not think them quite up to his standard. Mr. Hollyer has some charming little artistic sketches of rustic life. Mr. J. Milman Brown is again a contributor, and the Judges are pleased to see an improvement in his work, No. 582, "A Country Road," being the best. Mr. George Nesbitt exhibits some single figure studies, which are very fine.

In Section 2 (Amateurs) Mr. W. J. A. Grant has sent some exceedingly fine photographs of the Arctic Regions, taken during the expedition of 1878, for which he has been given a second silver medal. The Judges have taken into consideration the extreme difficulty in working in such a cold region. Three frames of views are exhibited by Mr. Andrew Pringle, of Italian and Swiss scenery, which are of special excellence. The Judges have awarded him a second silver medal. Mr. H. Manfield, of Northampton, exhibits some transparencies for window decoration. They are very fine in colour and perfect in manipulation. These have a first bronze medal. Mr. H. A. H. Daniell, of Bristol, sends six pictures of river scenery, happily chosen. It is the opinion of the Judges that if a little more exposure had been given to the plates the success attained would have been great. The Judges are glad to see their old friend, Mr. T. M. Brownrigg, again adorning the walls of the Society's exhibition. Mr George F. Powell's stereoscopic slides of ferns and flowers show merit. It is a pleasure to see Mr. Charles A. Fornley helping the Society by exhibiting some delicately manipulated rustic studies, and the Judges note that he has taken the hint given last year, and has added to the beauty of his productions by printing in skies. Mr. H. M. White's series of photo-ceramics are numerous and interesting.

Section 3 (Photographic Appliances). The exhibits of Mr. George Hare show wonderful ingenuity and excellent finish, and to the dry plate changing-box has been awarded a first bronze medal. Messrs. Avery and Co. send examples of material suitable for photographic backgrounds, which are highly commended. The duplex lecture lantern of Mr. H. Kevil shows some useful novelties. To it the Judges have awarded a first bronze medal. Malden's triple lantern by Mr. J. Middleton, of London, is a noble instrument, and shows several original points. It is in every way a most perfect instrument, and well deserves the second silver medal which it has gained.

EMULSIFICATION OF SILVER BROMIDE.

BY M. ANDRA.*

All the time that I have been pursuing my researches with gelatine emulsion I have not altogether neglected collodio-bromide; I am strongly of opinion that M. Chardon's process is one capable of rendering great services in cases where it is not required to take animated objects. Recently I have prepared my stock of dry collodion emulsion for the summer, and I will take this opportunity of mentioning my method of preparation, which has given me a fineness of grain such as I have never previously been able to produce.

In making gelatine emulsions, I had noticed the effect on the nature of the pricipitated bromide produced by the temperature of the solutions at the moment of mixing. Applying the same reasoning to collodion, I tried to mix the solution of alkaline bromide in that substance with one of silver nitrate in alcohol at comparatively a high temperature, and I am glad to say with the most complete success. The following is the method I adopted, working with about 800 cub. cents. of collodion:—

In a flask with a content of about 1,500 grammes I dissolve over the water bath the requisite quantity of silver nitrate in a few drops of distilled water, and add to it 200 cub. cents. of alcohol at a temperature of between 40°C. and 50°C., so that none of the silver is precipitated—on the contrary, the whole must be kept completely dissolved. Another flask, measuring about a litre, contains my bromized collodion. I now plunge the second flask without any stopper into a kettle of hot water (from 70° C. to 80° C.) which has been heated at a neighbouring fire, taking care to have a burner under the vessel at which I am working. This is a point of great importance, for although I do not allow the collodion to be heated to boiling, the vapour of ether is freely disengaged. By moving the flask about in the hot water for two or three minutes, its contents will have an average temperature of from 35° C. to 40° C., which is quite sufficient, and is very nearly equal to that of the alcoholic solution of silver nitrate.

I then pour through a funnel the whole of the collodion at once into the alcohol, and an emulsion of marvellous fineness is produced instantaneously. It is impossible, even with a magnifying glass, to detect in the creamy liquid a single clot, and its orange-red colour by transmitted light—a well-known sign of the excellence of an emulsion—is so pronounced that, were it not for its appearing white by reflected light, it might be thought to be a ruby-coloured fluid. Although I have not tried it, I feel convinced that an emulsion made in this way would not show any grain even with a microscope of high power.

I will not say that it is unnecessary to allow the emulsion to stand for forty-eight hours, according to the prescription of M. Chardon, in order that the double decomposition of the salts may be completed before neutralizing the excess of silver; but I maintain that no granulated or powdery bromide is ever formed, and this, as is well known, is a cardinal point in the preparation of collodio-bromide.

In conclusion, I recommend this simple method to those who, like myself, have not yet taken leave of collodion, a substance whose part in photography is, I think, not yet played out.

* Read before the Photographic Society of France.

THE PAGET PRIZE OF £50.

Report from the Committee to the Council of the Photographic Society of Great Britain with reference to the Prize offered by Joseph Paget, Esq., for a Dry-plate Process.

We, the members of the Committee appointed by the Council to consider the relative value of communications sent in competition for the prize offered by Joseph Paget, Esq., for a good Dry-plate Process, have now the honour to report to the Council the result of our investigations. Notwithstanding the wide circulation given to the conditions, we regret to state that only two processes were sent in competition, the one being a silver bromo-collodion, and the other a silver bromo-gelatine emulsion process. Testing the plates sent in illustration of the capacity of each, we found them sufficiently good to claim further consideration with regard to keeping properties. In order to do this under critical conditions, we securely packed, in an air and water-tight case, some of each kind, and had them conveyed to and from the Brazils. Submitting them after this ordeal to development in the presence of the members of the Committee, an undoubted superiority was apparent in the keeping capacity of the argentic-bromo gelatine plates. Further attention had therefore solely to be directed to the formulæ by which the latter were described to have been prepared. Acting according to the instructions given, we found practical difficulties to arise in their preparation, and decided that they were insufficient "to enable any ordinarily skilful photographer to produce results thereby, equal to those obtainable by the wet collodion process." Under these circumstances we deemed it expedient to apply to the author for more extended details of the process sent in competition. In reply we received a full exposition of a method for working the gelatine process, with a formulæ capable of giving satisfactory, although not rapid results. The process and formulæ differed, in our opinion, so much from the first contributed, that we could only regard it as a new rather than an explanatory description of the one illustrated by the trial plates tested. Under the circumstances, and according to the published conditions, which state, "That should the conditions not be entirely realized, the prize may be either awarded or retained for competition during the following year, at the discretion of the judges," we suggest that the prize be re-offered for competition for the best dry-plate process fulfilling the conditions, sent for adjudication on or before the 1st of September next. We would further venture to recommend that the award be definitely made at the December meeting of the Society, to the competitor who, in the opinion of a majority of the Award Committee, was most entitled to receive the same.

Signed on behalf of the Committee,

T. Sebastian Davis.
Leonard Darwin.
Peter Mawdsley.
Valentine Blanchard.

Conditions to be observed in the new competition for the prize of £50, offered by Joseph Paget, Esq., for a dry plate process.

1. The description of each process accepted in competition shall contain sufficiently accurate details to enable any ordinarily skilful photographer to produce results thereby, equal to those obtainable by the wet collodion process.

2. Plates shall, in the opinion of the Award Committee, be capable of being kept without injury, not less than two months between exposure and development. Should equally good results be obtainable by more than one process, the preference will be given to the one most easy of manipulation.

3. Each competitor, or his representative, shall have the option, or, if required, shall be willing, to prepare any special chemicals or appliances, and with such, or others prepared according to his formulæ, make, expose, and develop some negatives by his process in the presence of the appointed judges.

4. A description of each process accompanied with twelve 8½ by 6½ unexposed plates, and two or more finished negatives, shall be sent to the Secretary of the Award Committee appointed by the Council of the Photographic Society of Great Britain (competitors not being eligible to act thereon), addressed 5a, Pall Mall East, on or before the first of September, 1880. Competitors may send the negatives, &c., accompanied with their names and addresses enclosed in a sealed envelope, and marked outside with a cypher and an address, which will be returned unopened, should the Award Committee consider the specimen negatives or plates below the requisite standard of excellence. One or more of the negatives by the successful process may be retained for exhibition until the next meeting of the Society.

5. If there be two or more competitors the award shall be made at the December meeting of the Society to the one who, in the opinion of a majority of the Award Committee, is most entitled to receive the same. Should there be only one competitor, the prize will only be given if the process described is considered to fulfil the required conditions. The decision of the Award Committee shall be accepted as final, and the receipt of the prize shall be deemed equivalent to an agreement that the process may afterwards be published unconditionally, and practised by anyone. Processes other than the prize one will not be published under the direction of the Society.

The Photographic News.

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CONTENTS.

WOODBURYTYPE—THE OLD AND THE NEW.

We must congratulate Mr. Woodbury upon the success which has rewarded his efforts to reduce photo-relief printing to a simple form. As the method at present stands, with the last finishing touch that has just been given to it, no process of photo-engraving could be more easy or practical. Within a twelvemonth, Woodburytype has not only become untrammelled by patent, but robbed of every complication that stood in the way of vulgarising the process. We shall not be surprised, after this, if, when another year has passed, many photographers—or, at any rate, those in the first rank—take to producing their pictures by mechanical means instead of by sunlight, and exchange the frame for the press in their printing department. Already we hear of several Paris houses that have taken up photo-relief printing, while far-off Madrid, it is said, has sent representatives to the French capital to learn if the good news be true.

The lapse of the Woodburytype patent in England caused several in this country to take up photo-relief printing. Besides those directly interested in the patent may be mentioned the Autotype Company, and the London Stereoscopic Company, as among the first to recognise the value of the process. We all of us know the orthodox method of proceeding. A gelatine pellicle, slightly tinted, but still transparent, was sensitized in a solution of bichromate, and, after drying, exposed under a negative. The surface thus reprinted, having been rendered partially insoluble—where the light had got to it through the negative—was then washed in luke-warm water, the result, of course, being an intaglio, or image represented by hollows, more or less deep. This intaglio or mould, when dried and hardened, was put at the bottom of a shallow steel tray, the walls of which were knife edges; a sheet of lead was placed upon the mould, and the whole put under a hydraulic press. Enormous pressure was necessary. In the case of a carte-de-visite picture a pressure of something like 150 tons was required, while in the case of a picture measuring eight or ten inches, no less than a strain of 500 tons was deemed requisite to force the lead into the cavities of the gelatine image. The knife edges cut through the lead, and thus allowed the latter to fill up the tray precisely, a measure indispensable to prevent injury to the gelatine mould.

In this way, then, the engraving plate that served for the printing off of Woodburytype impressions was made. Not only are the operations very delicate and nice in their nature, but they involve much time and costly apparatus. The mere fact that a hydraulic press, capable of exerting a pressure of from 150 to 500 tons, is a necessity, was of itself sufficient to prevent Woodburytype being worked by photographers at large, and it was for this reason why only large firms could afford to practise the process. Now Mr. Woodbury shows us how press, steel-tray, lead, and hydraulic machinery may be dispensed with altogether, and any photographer who possesses a rolling press and a supply of tin-foil can prepare a properly engraved plate. The modification is so simple that it seems absurd the plan was not thought of before. Mr. Woodbury takes a positive instead of a negative to begin with, and with this produces his gelatine mould. This mould is hardened as before, attached the while to a surface of patent plate, so that its level character may be depended upon. As soon as dry, a sheet of tin-foil is placed upon the gelatine mould, and, to force the thin metal securely into every crevice, mould and tin-foil are sent through an ordinary rolling-press. This is all. The gelatine mould with its lining of lead—for tin-foil, as our readers know very well, is simply sheet lead—serves for printing off the Woodbury pictures, and to judge from the appearance of the prints with which Mr. Woodbury has favoured us, the impressions are equal in every respect to those furnished by moulds in which the lead is solid.

Of course there is the making of the gelatine mould in the first place, and the actual printing off of the impressions in the last, and to do these operations well and successfully, some apparatus and some experience are necessary. The experience can obviously only be acquired by practice, but we have no doubt that Mr. Woodbury will see his way to giving instructions as to apparatus and manipulations to British photographers in the same manner as he affords assistance to those abroad. Mr. Woodbury, we believe, is bound by some engagement or agreement not to do any teaching in the matter of photo-relief printing in this country, and hence it is that the important improvements he has recently made known come to us from abroad. The business arrangement between Mr. Woodbury and his co-operators do not, however, concern us, and our duty here is but to chronicle the simple and easy stage to which photo-relief printing has now been brought.

HOW TO TEST WHETHER A GELATINE EMULSION CONTAINS THE HIGHLY SENSITIVE FORM OF SILVER BROMIDE.

In making a gelatine emulsion you are often obliged to ask yourself the question: "Have I cooked my emulsion for a sufficiently long time, and is all the silver bromide converted into the sensitive state? Now it is quite easy to form an opinion on this point, without resorting to a photographic test. The *general plan*, as our readers know, is to flow a little of the emulsion over a glass plate, and to examine by reflected light; if the film of silver bromide be *green*, it is considered to be sufficiently converted; but if *white*, it is a sign that the emulsion has not been long enough cooked. This difference, which was pointed out by Van Monckhoven, is not, however, so easily recognized; the green colour is not so pronounced that every one is able to appreciate it. Indeed, we have more than once heard it asked, "Is this the green modification or not?"

Much easier is the test by transmitted light, recently so strongly recommended by Dr. Eder and Mr. Swan. A small quantity of the gelatine emulsion is poured on a glass plate, and its colour observed by holding it against the light. The less sensitive silver bromide has, by transmitted light, a more or less *reddish yellow* colour; but the highly sensitive modification of the salt—the green bromide, as it is called—appears *blue violet* or *blue grey* under the same circumstances. No other means is so efficacious in affording a test of the complete conversion of the silver bromide into its most sensitive condition. The change of colour by transmitted light (reddish yellow to blue) is much more striking than that by reflected light (white to green).

In this test the film may be viewed by transmitted light, no matter whether it be fluid or already set; only it must not be dried up, for unwashed gelatine emulsion, after drying, changes its appearance by transmitted light, because the soluble salts crystallize out. The plate, also,

must not be kept too long exposed to the light, or the silver bromide will change colour and turn grey, and any deduction drawn from the colour of the film would, under these circumstances, be marred. For this reason the examination of the test-plate should not be allowed to last longer than a few minutes.

Although this testing process will not render unnecessary a further photographic investigation of the sensitiveness of the emulsion, it is, at any rate, of great value as a preliminary inquiry. It will seldom be found to give an incorrect result, and the practical examination by photography will, as a general rule, confirm the preliminary test by the optical method.

Notes.

We are glad to announce that the long-looked for book of Captain Abney, on the "Practical Working of the Gelatine Emulsion Process," is now published.

Her Majesty is preparing with her own hands a descriptive catalogue of the numerous interesting presents that have passed into her hands since she ascended the throne. It is to be illustrated by photography, and as every gift, great or small, is to be represented by this means, the work will prove particularly attractive.

A correspondent suggests to us that inasmuch as nitroglycerine and guncotton are practically the same thing, a trial should be made of the former in the preparation of collodion. Our friend is right in his assertion that the two substances greatly resemble each other, the one being produced by the nitrification of a solid, and the other by the nitrification of a liquid; cotton is converted into guncotton by the action of nitric acid, and glycerine into nitro-glycerine by the same process, in both cases three equivalents of hydrogen being replaced by three equivalents of nitric peroxide. Moreover, after the substitution process, the guncotton resembles cotton just as the nitroglycerine resembles glycerine, and they are, as explosives, possessed with equal energy.

But from a photographic point of view the two products are widely different. Dissolved guncotton gives a dry film on evaporation of the solvent, but nitro-glycerine, so far as we have experienced, will only yield a greasy deposit. For we have already essayed to use nitro-glycerine as a photographic film exactly as our correspondent suggests. Nay, more; nitro-glycerine is a solvent of guncotton to the extent of nearly seven per cent., and the resulting gelatinous mass we have also essayed, but without success. The presence in the film of iodide or bromide of silver was without any desiccating effect. Another result will probably be found by any experimenter in this direction. Touching the film with the tip of the finger is sufficient to produce headache for twenty-four hours, accompanied sometimes with violent nausea.

Collodion pictures upon opal appear to be a favourite form of club portrait. M. Lafosse, of Manchester, we hear, has recently produced no less than 6,000 opals, measuring 13 by 11 inches, in satisfaction of club demands.

Photography by gaslight. Our readers will peruse with interest the details we give of Mr. Laws' happy solution of the problem. With sensitive gelatine films at our disposal, there is no reason, apparently, why gas should not be generally employed for illuminating the studio in winter time. Mr Laws gives an exposure of but eight seconds with his light.

Mr. Jabez Hughes thinks that illuminating apparatus of this sort should be useful for auxiliary lighting; that is to say, in dull weather, when there is only light enough to illumine the model generally, a gas lamp and reflector might be employed to throw definite shadows, and accentuate the points of a picture.

In the rapid preparation of gelatine emulsion in warm weather, the employment of ice is particularly welcome before the washing operation. Without artificial cold the gelatine will not set properly, and in washing ill-set emulsion you may lose half of it, if not careful. A good plan is to run the emulsion into a jelly-tin surrounded by ice, and then the firm blancmange-like mass may be cut up and washed without risk of loss.

On Tuesday last the delay in finishing the Ordnance Survey of the United Kingdom was commented upon in the House of Commons. By affording the director a larger staff, the difficulty, it was stated, might be avoided; and really this plan, or the alternative of the Austrian Map Department, should be adopted. In Vienna there is no hand-engraving at all; the maps are sketched in Indian ink on paper, and afterwards photographed and transferred to metal, as in the photo-lithographic process.

It is generally supposed that the début of photography in the Field was at the time of the Crimean War, when two young officers—Ensigns Brandon and Dawson—were instructed by Mr. Mayall, and sent by the late Lord Panmure to Sevastopol. But a circumstance appears recorded in the "Journal of Henry J. Raymond," which we quote from *Scribner's Magazine*, that is interesting, though, no doubt, more strange than true. Says the extract: "He had been an intimate friend of a Mr. Müller, a plain man, educated as an engineer, who had been a confidential friend and adviser of Napoleon I., and who claimed to have invented the Daguerreotype long before the time of Daguerre, and to have used it for military purposes during the wars of Napoleon. He was at Waterloo, and left France after the fall of the Emperor."

Photographers who delight in rapid development, listen to this. Examining a little while ago a pretty picture of Russell Manners Gordon, a photograph some six inches long, of an old hulk lying deep in the low wet shore, the dark timber in pleasing contrast with the shining sands, and the whole more like the work of an old Dutch painter than of the modern camera, we asked this master of dry-plate work the rate at which he was wont to develop his pictures "Sometimes two in a day," was the answer.

Our painters are at last beginning to understand the advantage of photography as a means of reproducing their work. The French and Germans found it out long ago, and such firms as Goupil of Paris, and Albert of Munich, have for years past made photographic copies of modern paintings a lucrative business, both for producer and reproducer. Witness the charming pictures in monochrome of the French and German school, that may be bought now-a-days for a few shillings, the vulgarising of which permits the publisher to pay a handsome fee for copyright, to say nothing of the publicity given to the artist's name. And yet two years ago a British painter would sooner have boiled the pot with his painting than allowed it to be published by photography.

Nous avons changé tout cela. English painters have suddenly become as anxious to direct the attention of the camera to their work as they previously were to shun it. The Autotype Company, the Woodbury Company, and other photographic publishing houses, instead of being suppliants, are now earnestly entreated to take up work; and, in lieu of begging, they may now pick and choose. In these circumstances we shall soon have photographic publishing firms in London as extensive as any on the Continent.

Topics of the Day.

COLLODION TRANSFER ENLARGEMENTS.

BY GEORGE BRADFORDE.

ABOUT thirteen years ago I was travelling over Scotland making pictures for a large firm—a firm especially connected with Scottish scenery. We had been all through the Trossachs—we had reproduced in miniature the sterile wastes of Glencoe—we had camped at the 'spital of Glenshee, and brown, ragged, and dust-strewn, we at length burst upon the beauties of Balmoral. Within a few miles of the Highland home of our Queen, we found the village of A——, and put up at the inn.

On our route, we were for ever glad of any news from "smoke," as our quondam assistant irreverently termed the great city of London. We very seldom saw a photographic paper, for our route did not lie through the larger towns, but quite the reverse, it lay through the flood and the field, where villages even were scarce: thus we were for months in a benighted state, and knew not what great changes might have taken place. The art was almost everywhere represented in the villages: sometimes we would drop upon a lame dabbler, sometimes the chemist tried his hand at it; but, as a rule, it was represented mostly by amateurs, such as the schoolmaster, the minister, and the laird's sons. Whenever we dropped upon one of these, we would eagerly and anxiously ask for the NEWS, to find that our purposes were mutual, and that there was no NEWS.

Who would have thought that we should have stumbled upon anything new in the outlandish village of A——? Yet we did! There was a resident photographer, we were informed, "a vera guid man, just doon by the gavel o' the Kirk," so after supper we strolled down to have a look at him. We soon discovered his ridged roof, and were delighted to perceive that he was still open. One window we gave a cursory glance at; it was the same as we had seen hundreds of times. Great grim-looking faces, ghost-like in their ghastliness, and awe-inspiring in their fixed and earnest gaze; groups of uncouth natives, "kilted kimmers wi' carroty hair"; a horse or two, and a prize cow—such were the specimens exhibited by the disciples of our art in the Ultima Thule in those days. Passing from such a window, and giving a sly peep in at the small door, we took our station at the other window. Fancy our amazement when we therein beheld four or five large strange-looking pictures—pictures that puzzled us! They were not paper, that was certain! They were not upon glass, that was obvious! Then what on earth were they?

"Perhaps they are leather," suggested someone.

We were full of stories at the time of the American war, and how every Federal had a positive on leather of his beloved, that he carried next his heart as a charm against the southern bullets—hence the suggestion.

This was the nearest approach we could make as to what those grey smooth-surfaced pictures could be.

We might have solved the mystery on the spot, had it not been for our irrepressible; for the artist, hearing strange tongues in controversy at his window, made his appearance at the door, just in time to hear the latter exclaim, with great gusto, "Aint they beastly!" The hirsute Celt scowled upon us, looked us over with contempt, slammed his little door, and disappeared, justly leaving us in our ignorance.

These were the first collodion transfers that I ever had seen; and I am sure Donald, if he sees this, will excuse me if I, at this date, add my testimony to the irrepressible—they were beastly. Still all praise is due to the Donald for his efforts to progress. It was before renovating the negative was thought of, and Donald's costumes were mostly weather-beaten Highland men and women, with angular faces covered with freckles; then again he made the mistake of developing with his ordinary negative solution, and, with no thought of toning them, had produced those dull grey supernatural-looking pictures which had so amazed us.

Where the hirsute photographer of the North had got his idea from, I cannot tell; whether it was extempore from his mother-wit, or based upon some rumour from the south, to this day remains a mystery; enough, if I state that upon returning to London we found M. Disderi creating quite a sensation with transfers. Since then collodion transfers have occupied a place in every phase of the photographic world, from the humble struggler in clubs to the high-class studio.

I do not mean to say that the literal transfer is admitted directly within the sacred precincts of the high-class studio, but indirectly it has its place, and not a mean one either. Ten or twelve years ago, when a painting was wanted, the artist demanded sitting upon sitting; his skill in drawing alone was the means of reproducing on the canvas the fac-simile of his client—his eye to catch the bright look, his talent to select the becoming pose! How is it now-a-days? In ninety-nine cases out of one hundred the photographer has all the above duties to perform. He studies the subject, talks it into good humour, seizes the happy expression, and then, with a *coup de main*, places the collodion upon the canvas, so that the artist has nothing to do but mix his paints and begin work.

This may not be high art, but it is easy and very remunerative; we do not see so many artists out of elbows as formerly.

It is enough for me to mention the prominent position the collodion transfer takes in the remunerative club trade, to ensure earnest attention to a simple process how to make them. That is one of the principal features of the collodion transfer, and in this respect takes precedence over all other kinds of enlarging, viz., the ease, the simplicity, and rapidity with which it is made: and I shall try to be as simple and rapid in my formula; in short, I shall try to put the whole process in a nut-shell, so that he who runs may read, and the anxious photographer with the bad memory can stick it inside his dark-room door.

Imprimis. The bath should be in good working order, with no tendency to fog. The glass employed should be picked carefully, so as to be without scratches, &c. The collodion can be any maker's so that it contains a good body. I myself prefer a collodion a month or two iodised.

The negative must be fully exposed, with all the detail showing; if it is a little thin for ordinary printing, you will find it produce the best results in this kind of enlarging. Thus, if your customer ordered cartes and an enlargement, I should advise the taking of separate negatives for each purpose. The camera or copying box should be so constructed that a movable carrier is made for the lens half-way between the negative at one end and the ground glass or dark slide at the other. The length of the box depends upon the size of the picture required and the focal length of the lens used. At present I work with a bellows camera, and when enlarging a seven or nine inch head right away, lay a board over the top, and cover all the body round with a cloth. I put my negative in the dark slide of a half-plate camera, open the shutters back and front, and using the camera—the half-plate one—as a tunnel, place it before my lens. This answers all right, and there are many such dodges that photographers would do well to study, and not lumber their places up with huge contrivances that only work for one purpose. In operating, a piece of white cardboard should be placed at an angle so as to throw a strong reflected light upon the negative, and secure a perfect background. The exposure depends entirely upon the lens used and the strength of the light; practice is the only thing that can make one perfect in this important part of the process. I may mention that a full exposure and a short development generally produce the best results; a short exposure and prolonged development are apt to bury the image, and produce a hard picture, lacking in detail. The following developer will be found to work well :—

Water	10	ounces
Glacial acetic acid	½	ounce
Citric acid...	¼	,,
Protosulphate of iron	¼	,,

The use of glacial acetic acid tends to a brown tone.

After fixing with either cyanide or hyposulphite, and thorough washing, the picture should be toned with a solution of gold, one part chloride to three parts water. You can easily see on the glass side when the operation has been carried far enough. A good tone may be obtained by a weak solution of bichloride of mercury, followed by a still weaker solution of sulphide of ammonium, but I would not recommend the latter, as it is apt to make the film tender, and renders the final operation of transferring difficult.

If the tone is still unsatisfactory, try the following formula, which our Editor, I see, is very fond of recommending :—

Bichlor. iridium et potass. sat. sol. ...	1 drachm
Water	10 ounces
Chloride of gold	1 grain

There are different ways of transferring the film from the glass to the paper. The double transfer paper used by the Autotype Company is as good as any; soak a piece the size (or I should rather say a little larger than the size) of the plate, and apply it to the film very gently; use a squeegee, but take care that it does not press unevenly and break the film. If the plate has not been waxed, you must commence the removal as soon as the paper feels dry to the touch. But as much depends upon the cleanness of the glass, I should advise that a solution of spirit and white wax be applied to the plate before coated to facilitate the removal.

The following is the method recommended by Dr. Moitessier :—

"After the last washing the plate is placed on a stand in a perfectly horizontal position, then apply a piece of ordinary albumenized paper previously moistened, taking care that no bubbles of air are retained between the paper and the collodion; now raise up the plate, holding the paper by the two corners to prevent its slipping, and the whole is kept in a vertical position for a few moments to allow the water to drain off. The plate is then left to itself until the paper is completely dry; it may be put in the sunshine, or brought near a fire to hasten the drying. Finally, the plate is immersed in a bason full of water, and at the end of ten or fifteen minutes the piece of paper detaches itself almost spontaneously, bringing with it the collodion film."

Any kind of paper can be prepared to receive the collodion film by floating it on a solution of mucilage; it can be dried and kept for any length of time; drawing paper can be so treated, and very fine results obtained.

The "Topic" for next week will be "Reversed Images," by Captain W. de W. Abney, R.E., F.R.S., &c.

A NEW DEVELOPER.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S., ETC.

SOME two years ago I began a series of experiments on developing agents, with a view of finding some one which would only act on the silver bromide which had been acted upon by light, and not on silver bromide as well. Now everyone is aware that the ordinary alkaline development (except by a *tour de force*) acts upon silver bromide unless a restrainer or retarder such as gelatine or soluble bromide be at hand during the development. Except in the case of albumen beer plates in the form which I originally introduced, no collodion film, as far as I am aware, could be treated with pyrogallic acid and ammonia without a hopeless fog ensuing. In this case the albumen acted very much like gelatine does in the gelatino-bromide plates, and this process is therefore no exception to the rule. The most crucial test for a developer is to apply it to a plate coated with ordinary washed collodio-bromide emulsion, the film having no preservative. There are several organic substances which can be applied as preservatives, and which, when ammonia is applied, will cause a faint image to be developed; but intensity is always wanting. It would scarcely interest my readers to give the theoretical reasonings which led me to try a substance which is but little known, viz., hydro-kinone. It is sufficient to say that as a developing agent it is very perfect, and can be used in a collodion emulsion film without the slighest trace of restrainer or retarder; in other words, it requires no soluble bromide with it.

Hydro-kinone is a derivative from kinone, and, on the addition of certain metallic compounds to it, acts as a reducing agent. It is soluble in alcohol, and in water to a large extent. The following experiments are worth a trial. Dissolve one grain in two drachms of water, and expose a collodio-bromide plate for half the time necessary with the ordinary alkaline developer, and apply this quantity of liquid with one drop of strong ammonia. The image will appear quietly, and show all detail, but on fixing will be rather too feeble; it will take silver intensification, however, perfectly. Double the quantity of hydro-kinone, and again develop a plate, and it will be found that the intensity is of a medium character, whilst by trebling it, it will be found that proper density is secured. With gelatine plates the same experiments may be repeated, a less quantity being apparently requisite to give proper printing density, than with collodion films. On fixing the plates they will be found perfectly free from any veil caused by a reduction where no reduction should be, and they will give brilliant prints.

It may be asked if the hydro-kinone has any advantage over the ordinary alkaline developer. I am inclined to think it has—in that the faintest trace of the action of light is made apparent, and is not destroyed by the soluble bromide. This should be a decided gain, and on testing it against ferrous oxalate (without bromide) in gelatine plates, it seems as if this were borne out. With collodion plates it has a decided advantage, and it may be worth a trial. A curious experiment is to prepare a collodion plate, wash it, and pour over it a solution of hydro-kinone and ammonia, and then expose in the camera; it will be found that

development commences during the exposure; whereas such an attempt made with ordinary alkaline or ferrous oxalate developer would prove a failure. The great objection to the use of this compound is its price; it is expensive, but doubtless any demand for it would quickly reduce it to nearly the same price as pyrogallic acid. It is at present more a chemical curiosity than of any commercial use, but if it should prove to be a good developer, it would speedily find its way into the price list of manufacturing chemists at a more moderate rate than that at which it is now shown.

THE INFLUENCE OF TEMPERATURE ON THE SENSITIVENESS OF GELATINE EMULSION.

BY DR. J. M. EDER.

Many formulæ for the preparation of gelatine emulsion are given, but few of them agree as to the temperature at which the emulsification is to be carried on. One recommends emulsification at ordinary temperatures, another at from 30° to 40° C., a third at 60° C., and some go even so far as 100° C. Now it is well known that temperature has a great influence, not only on the formation of the more sensitive modification of silver bromide, but also on the rapidity with which this modification is formed. I have, therefore, in conjunction with Capt. Toth, made an attempt to arrive at some determinate conclusion on the conditions of this important question.

In all our experiments, silver nitrate and potassium bromide were used in the proportion of 5 : 4; there was, consequently, always an abundant excess of bromide present.

1.—At ordinary temperatures—that is, from 15° to 20° C.—there is formed only the less sensitive modification of silver bromide, which transmits the red rays. If an emulsion of gum-arabic be prepared in the cold (according to Mawdsley's formula) we shall get a comparatively non-sensitive emulsion. Equally non-sensitive is an emulsion which has not been digested, but is at once flowed over the plates after the silver nitrate and the alkaline bromide have been mixed. A gum-arabic emulsion, prepared cold, does not improve by standing, even for three weeks; at the end of this time it still contains the silver bromide in a non-sensitive condition. Negatives taken with it are, it is true, clear and dense, but the plates possess so little sensitiveness that they cannot be compared with those coated with an emulsion prepared with the aid of heat. Even the addition of from 1·5 to 2 per cent. of ammonia produces scarcely any effect; the sensitiveness certainly is heightened after standing for from twelve to twenty-four hours, but still not sufficiently so, and even at the end of a week the bromide has not been converted into the sensitive modification. Increasing the proportion of ammonia to 6 per cent. is not an effective substitute for warming the emulsion.

Hence we conclude that emulsifying in the cold will not produce very good results. By the cold method it will never be possible, even after a great loss of time, to arrive at that high degree of sensitiveness which, by the hot process, is attained in a few hours.

2.—At a temperature of from 32° to 48° C. the silver bromide passes gradually over into the sensitive condition. At the end of twenty-four hours the conversion is not complete, but after from three to six days the emulsion contains bromide in its most sensitive form. This process, which was first mentioned by Mr. Bennett, gives excellent results, but if the emulsification be carried beyond six days, fogging will ensue.

Ammonia (1·5 to 2 per cent.) promotes, at from 30° to 40° C., the formation of this modification to an extraordinary extent, as was first pointed out by Van Monckhoven. But even at this temperature the change does not take place immediately, but requires a period of from one to two hours. Occasionally, when there is a great excess of soluble bromide, the conversion will not have taken place in from six to eight hours. If the emulsion be heated with ammonia for too long a time—say from six to ten hours—it will show signs of fog.

It follows from these remarks that the conversion of the bromide into its sensitive modification is greatly promoted by ammonia, but that, in this case also, much advantage is obtained by heating it.

When ammonia in a *nascent state*, is made to act on silver bromide, the conversion is effected more quickly, and at a lower temperature. For instance, if a solution of potassium bromide be mixed with one of the ammonio-nitrate of silver, or an ammoniacal solution of potassium bromide with an aqueous solution of silver nitrate, the complete conversion of the silver bromide will take place in from fifteen to twenty minutes at a temperature of from 28° to 35° C. This is the quickest method of producing the highly sensitive form of silver bromide, and I hope soon to be able to describe a process founded on it.

3.—At 60° C. the silver bromide is modified much more rapidly than at from 30° to 40° C.; this was first observed by Stuart Wortley. In fact, the emulsion is in great part already modified at the end of a quarter of an hour. After the lapse of four hours the change is as complete as—perhaps even more complete than—it would be in four days at 40° C. After cooking for twelve hours the emulsion gives plates of great sensitiveness and clearness, but I do not think that the digesting can be carried on beyond that time without harm.

Digested with ammonia at this temperature an emulsion will assume its highly sensitive condition in a few minutes, but it is apt to work foggy; in fact, a gelatine emulsion will not stand stewing with ammonia at a high temperature. When ammonia is present the temperature should never be raised beyond 40° C., otherwise fogging will result, and the emulsion will mostly be altogether spoiled.

A very advantageous method is to introduce the silver nitrate with a hot (60° to 70° C.) solution of potassium bromide and gelatine; when both the solutions are hot at the time of mixing, the conversion of the silver bromide is effected much more quickly than when the solutions are mixed cold, and then digested over heat. A high temperature, therefore, produces the modification particularly quickly if the silver bromide be exposed at once in its nascent state to heat.*

4.—At 100° C. the conversion takes place most rapidly; after a quarter of an hour's boiling it is nearly, and in half an hour quite, complete, this sensitiveness being then about equal to that obtained by a five days' simmering at 35° to 40° C. Should the boiling, however, be long continued, the emulsion will fog, and an hour-and-a-half's boiling will completely spoil it. The process of emulsification at boiling heat was, in my opinion, first made public by Mansfield in a communication to the Photographic Society of Ireland on the 13th of August, 1879, and, as will be familiar to the readers of the Photographic News, it has been strongly recommended by Captain Abney.

I have also observed that an emulsion which has been boiled for half an hour increases materially in sensitiveness by digesting it still further with ammonia, care being taken that during this latter operation the temperature is not allowed to rise above 40° C. From this observation I have worked out a second method for producing very sensitive emulsion, and hope to publish it very shortly.

The general result of my investigation is, therefore, that heat is an excellent means of promoting the sensitiveness of emulsions, and that it should consequently never be dispensed with. But it must be recollected that the higher the temperature the more liable is the emulsion to fog quickly; hence, the higher the temperature the greater must be the care used and the precautions adopted in emulsifying.

* This fact was discovered both by Van Monckhoven and by myself simultaneously, but quite independently of each other; compare the dates of our respective publications.

SOME EXPERIMENTS WITH ASPHALT FOR PHOTOGRAPHIC PURPOSES.

BY J. O. MORCH.*

In the appendix to the second edition of Husnik's "Manual on Collotype Printing" (*Gesammtgebiet des Lichtdrucks*) are some instructions for the preparation of a sensitive solution of asphalt founded on the researches of Dr. Kayser. The general principle consists in purifying finely-powdered asphalt of the noxious constituents by separation with ether. A solution of this kind is already produced commercially, and its sensitiveness is very satisfactory. I had succeeded in purifying asphalt by another method, which I now proceed to make known.

In the first place, I select a suitable kind of asphalt, which may be known by the following peculiarities. The powdered asphalt must have a deep chocolate colour, without any tinge of yellow; it must not be soluble to any extent in turpentine; its melting point must be as high as possible—not less than 100° C. Having obtained such an asphalt, I make a tolerably concentrated solution of it in chloroform, in a good-sized flask. When it is all dissolved, I add three times its volume of ether, shaking well during the process, and let it stand for two days. The ether throws down the sensitive constituent of asphalt; so I collect the precipitate on a filter, dry it thoroughly in the dark, and then dissolve it again in coal tar benzole.

As regards the development, it is to be observed that it is very difficult to control, in consequence of the rapidity with which it takes place. In order to be better able to watch this part of the process, I always let the plate cool before proceeding to develop, as, in consequence of its exposure to the direct rays of the sun, it is liable to become heated. Besides this, I mix a few drops of balsam of Peru with a sensitive solution of asphalt, somewhat in the following proportions:—

Asphalt, dissolved in 150 cub. cent. of benzole 10 grammes
with the addition of—
Balsam of Peru ... ... 5 centims.

With this solution I am able to keep the development tolerably under control.

In this operation I find it most convenient to follow Husnik's directions with oil of turpentine and subsequent washing with spirit. Generally I use the following formula:—

Coal tar benzine ...	... ...	20 grammes
Spirit of turpentine	... ...	50 ,,
Methylated spirit ...	... ...	100 ,,

and this quantity serves me for many plates. When the solution is complete, I rinse well, first with spirit, and then under the water tap.

Should the plate be over-exposed, so that fog shows itself in the high lights, the plate must be washed, dried, and then warmed to a temperature of from 45° to 50° C., and finally have the developer again flowed over it; the drawing will then re-appear quite clear in the places where it was previously fogged. Rubbing, or even gently passing a brush over the plate, I cannot recommend, as the drawing is so liable to injury.

If I have time, I generally expose the plate after development as long as possible to direct sunlight, in order to heighten as much as I can the insolubility of the film, and by this means the protecting power is considerably augmented. The shadows, which, when the transfer is etched, print generally of so grey a tone, on account of the etching fluid having worked through the coating, have, when this operation is resorted to, a fine black colour, and this contributes considerably to the excellence of the result.

When the asphalt process is in skilled hands it does not deserve the objections of uncertainty, slowness, and costliness that have been raised against it. On the contrary, it possesses in many respects great advantages over the chromate process. Especially the tranfer printing is avoided, as well as the continual blackening of the plate with a sponge, and the time consumed in these manipulations is now so much gain. Besides, the results, more especially in the case of reductions, are much finer. The strongly adhering layer of asphalt protects, as has already been remarked, better than the best colour, including the powder method.

For the production of etchings on glass, inscriptions on metal by the etching process, as well as for design rollers, the sensitive film of asphalt as a protective coating may always be used with advantage. Recently I have by means of the asphalt process successfully taken transparent positives for the lantern, being copies of the illustrations of various books of travel, and have found them to be specially adapted for such reproductions, on account of their sharp outline and freedom from fog.

* *Photographische Notizen.*

Correspondence.

THE PRINTING BATH.

Sir,—If "Countryman" disagrees with my method, it cannot alter the fact which long experience, observation, with a little knowledge of chemistry in my business, dictate as a perfect method to gain perfectly toned and unstained prints.

I should not like to employ a person called a printer who would handle fixing and toning solutions alternately and indiscriminately, without the slightest knowledge of their effect. That would be a novice, not a printer, and I assumed "Troubled Printer" to be a printer, and not a novice. But this I assert, as well founded by the past twenty years' daily experience: that silver sensitizing solutions soon absorb impurities from albumenised paper, more or less according to the thickness and nature of the albumen used; and if that is not eradicated by fortnightly or monthly boilings, and taking away the dark residue, it will eventually retard all toning, causing mealiness and all kinds of stains of different characters upon the print. And as I stated previously, old worn toning solutions aggravate, excite, and assist those stains to be more fully developed. I certainly should not waste my gold solution by pouring the used or worn toning (with its free silver, which does and must exist in degrees in it for its effective working) back into a standard solution to precipitate the gold therein to a considerable extent. I should advise "Countryman," for his own pecuniary benefit, to study the chemistry and economy of this matter alone, before he ventures or attempts again to place himself in the position he has done.—I am, sir, yours, &c.,

C. J. Hopkins.

THE MALVERN PORTRAIT.

Sir,—In consequence of the large number of letters I have received respecting the "Malvern portrait," I must refer intending correspondents to the notice of an excellent wholesale dealer which will be found in the advertising columns.

I am quite too busy making the "Malverns" to be able to answer all the queries respecting them.—I am, sir, yours faithfully, Norman May.

HALATION OR BLURRING OF GELATINE PLATES.

Sir,—I notice in your issue of the 2nd inst. an article respecting halation or blurring of gelatine plates; also remedies for same. I use a piece of black velvet stuck to a piece of cardboard the size of plate, and find it answers thoroughly, and has simplicity to recommend it.—Yours truly, Alfred Freke.

SUBSTITUTES FOR COLLODION.

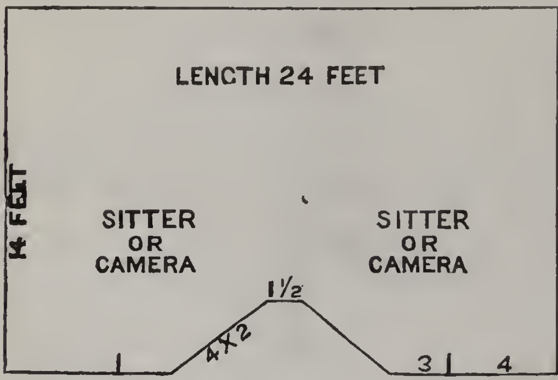
Sir,—Are not gun-cotton and nitro-glycerine pratically the same thing? I mean, are they not made in the same way? If this is so, why cannot we use it (I mean the nitro-glycerine) in making collodion? Perhaps this suggestion would help experimenters who are trying to make a collodion emulsion as sensitive as a gelatine emulsion. I believe you convert the glycerine in the same way as cotton—that is, with strong acids; but I do no more than throw out the suggestion. I see that somebody has proposed a solution of silk.—Yours faithfully,

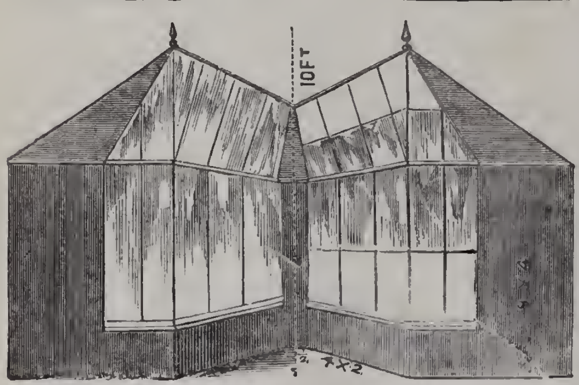
One of your Subscribers.

[See our "Notes" for this week.—Ed. P.N.]

USEFUL STUDIO.

Dear Sir,—Reading in the News recently "W. L.'s" letter requiring hints for a studio, *he being blocked in on the sides*, I do not think you could do better than kindly insert a sketch of my own. Half the studio may be





curtained down, doing away with a hood to the camera. The front of studio is everything "W. L." could desire. Its practical advantages, which I have proved, are—1. The most effectual studio for *short exposures*. 2. With half the studio shut, in doing away with hood to lens. 3. Best form of lighting for the *high-lights*. 4. The sun's rays not affecting the light at any time of the year, should you have a north light.—Yours faithfully, Geo. Tuohy.

Talk in the Studio.

The *Echo* says:—"We learn that Mr. P. Barry, a member of the London Press, has discovered a process for the conversion of drawings into sharp relief blocks for letterpress illustration by merely pouring type-metal on them."

Winking Photographs.—The *Scientific American* says:—"Winking photographs are said to be produced in the following manner:—One negative is taken with the sitter's eyes open; another, without change of position, with the eyes shut. The two negatives are printed on opposite sides of the paper, 'registering' exactly. Held before a flickering lamp, or other variable source of light, the combined photographs show rapid alternations of closed and open eyes, the effect being that of rapid winking."

Misleading, at Least.—In a recent issue of the (American) *Printers' Gazette and Reporter*, a beautifully printed full-page illustration was inserted as an advertisement from a photo-engraving company. The subject is a rushing stream with massive boulders in the foreground and a background of exquisitely delineated trees fading away in the distance. Here is the imprint: "From a photograph by the Photo-Engraving Co., 67, Park Place, New York." The inference is that the scene was photographed from nature, and the raised block produced therefrom—a possibility in art which, up to the present time at least, has never been achieved: the block is a palpable reproduction of a print, and it would have been more honest to have said so.—*Paper and Printing Trades Journal.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

Jeffery.—If you have any carbon tissue, try that; it is the best backing we know; but see our leader on the subject a few weeks ago.

George Brighton.—It will do no harm; in fact, it must be used in warm weather, if you want to wash the emulsion at once. You will lose half of it if you begin to wash before it has set properly.

G. T.—The Criminal Investigation Department at Scotland Yard. Mr. Howard Vincent is the chief of this branch, and you ought to get some sort of introduction to him. The collection is a very extensive one, and would take hours to look over.

K. X.—Never, unless you write first for permission.

B. Witworth.—Yes, it is Durand's paper; no sensitising is required.

Aden.—You cannot make sure; there are so many albumised papers in the market that no general rule holds good. Have your hyposulphite bath fresh and strong, and wash thoroughly. But there is no absolute specific against failing. You must do your best. "It is not in mortals to command success, but we'll do more, Horatio, we'll deserve it."

J. Smith.—Acetate toning, with a little carbonate, should give you all you desire; this is, indeed, what Payne Jennings employs. He described his method on mounting upon glass but a few weeks ago in these columns.

Porter.—A little French chalk rubbed upon the glass plate before collodionising will do what you require.

T. Cartwright.—Very well, then, do not filter in that way. Swedish filtering paper you may always rely upon.

R. Wilson.—It is done by two printings, the first generally weaker than the second.

R. T.—Add a little sulphuric acid.

Triton.—You may tint the print by flowing over it collodion colored with a little Judson's dye. Take the mounted photograph between thumb and forefinger as if it were a glass plate, and apply the collodion in the usual way; it would rather preserve the picture than otherwise: certainly it would not add to its perishable character. The effect is sometimes pleasing, but usually fleeting.

In a Fix.—Is it not the warm weather that is at fault? The dipping bath is very susceptible, and if not kept cool gives rise to all sorts of phenomenal appearances. In Paris, a receptacle filled with ice is frequently employed in the vicinity of the bath. We have employed many of Cobb's plates, and they work very well in our hands; dip in methylated spirit before or after development, as you please, or flow the film with it; this will prevent or cure frilling.

Henry Smith.—We have never heard of such a substance, and can hardly believe in its existence. We know the methods employed in map-printing at Southampton and Vienna, and have never heard of such a thing in connection with them.

W. Barry.—You can buy it of Messrs. Ihlee and Horne, 31, Aldermanbury; it is expensive, something like thirty shillings a pound, we believe.

J. B.—1. A good formula is given in the News of April 9th and 16th. 2. See "In a Fix." 3. Yes.

A. A.—1. Flow the film with methylated spirit. 2. Use a little bromide solution in your developer.

S. P. A. K.—The result is no doubt due to imperfect reduction of the silver; we will consider the matter and write you again.

Assistant.—Mungo Ponton, in 1839.

I. W., and Wyatt.—Received with thanks.

The Photographic News, July 23, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photographing by Gaslight—American Photographers and the Gelatine Process—Photographing Sea-Birds—Lantern Entertainment.

Photographing by Gaslight.—Mr. Law's method of photographing by gaslight opens up quite a new possibility in the way of artificial illumination. It certainly has the advantage of simplicity as compared with electricity. Without the sensitive gelatine plates the process, perhaps, could not be worked conveniently for portraits; but as gelatine plates, fortunately, do exist, the want of sensitiveness as compared with daylight does not very much matter. Eight seconds for a carte portrait is, after all, an exposure of which no complaint can be made on the score of rapidity. On reading the description of Mr. Law's burner, it occurred to us whether anything would be gained by the use of a gas-flame on the same principle as that in use in the clock tower of the House of Parliament. This burner, as most Londoners know, is fixed above the clock at a height of over three hundred feet from the ground, and is kept alight to inform the outside world when Parliament is sitting. The form of burner now in use was only adopted after a large number of experiments, and certainly gives a most intense light which can be seen from a great distance. This burner consists of a number of jets placed opposite to each other somewhat like teeth, only, of course, the jets are in clusters, and not in rows. By this arrangement half the gas decends from the upper cluster of jets, and half ascends from the lower, the flame from each mingling in the space between the jets. The consumption of gas is large, but the body of flame could scarcely be exceeded in brightness. Of course it may be that the lamp which Mr. Laws uses is as good as can be obtained, still, as the standard of sensitiveness is daylight, and as the gas portraits, good as they are, have not yet reached this point, any increase in rapidity must be looked for in an improved form of burner.

American Photographers and the Gelatine Process.—The "Britisher" has certainly gone ahead of Brother Jonathan in the matter of dry plates. It is almost amusing to read in the discussion of the Photographic Section of the American Institute, Professor Seeley gravely stating that he believed a new gelatine process was much used in Europe, which Dr. Draper's experiments had led him to think was a great deal better than the wet process. Apparently very little research has been made in America into the subject of gelatine plates, as from the remarks of other speakers it would seem that the sole experience has been gained from plates exported from Europe. It is not likely that much progress will be made until the American photographers prepare gelatine plates for themselves. The drawback to the process is that absolute certainty cannot yet be guaranteed. Whoever may be the manufacturer, and no matter the amount of care he bestows on his work, there are times when batches of plates are sent out, a large proportion of which turn out failures. The most annoying part of the affair is that in many instances the cause of these failures cannot be traced. Under these circumstances it is evident that, as regards dry plate work, the American photographer is heavily handicapped, because at present he is working in the dark, and cannot readily get information on points of detail from the manufacturer who lives some three thousand miles away. But this is only a question of time. It is now fairly established that the gelatine process has advantages which cannot be claimed for wet collodion. The results are no longer fugitive examples which sceptics might be tempted to call "flukes," but are the productions of everyday commercial work. As we have already said, there are failures, but failures are not unknown with the collodion process, and it would be unfair to reproach the new for a defect which belongs also to the old. Our American friends may take it as an absolute truth, that in Europe the gelatine process is an accomplished fact, and they will have to bestir themselves if they do not want to be distanced by the old country.

Photographing Sea-Birds.—Without in anyway detracting from the merit of Mr. Chadwick's photograph of a sportsman shooting sea fowl, we are inclined to think that with a gelatine plate of only moderate rapidity it is comparatively easy to secure pictures of sea-birds on the wing. Dwellers on the sea coast are perfectly familiar with the spectacle of gulls remaining apparently motionless in the air, especially when the wind is blowing strongly. This phenomenon has lately attracted the attention of scientific men, and a variety of theories has been put forward to account for it. Mr. R. Proctor, for instance, believes that the true explanation is to be found in the enormous propelling power of a bird's wing, by which it acquires a momentum needing only a few slight movements of the wings to sustain it in mid-air, and cause it to progress. Sir William Thompson, on the other hand, speaking on this subject at the meeting of the British Association at Glasgow, was of opinion that in still air, if a bird held its wings inclined at a small angle to a horizontal, it would descend in an oblique direction; but if the air be in motion, or a velocity equal, but a direction to, that of the bird, it would descend slowly in a perpendicular direction. Suppose, however, the air-current or wind had an upward tendency, caused, for instance, by having to pass up the slope of a hill, the bird might, by a suitable adjustment of its wings, make use of this upward force to counteract its downward tendency, and thus remain supported by the upward current in a fixed position. Which of the two theories be correct we are unable to say, but the fact undoubtedly remains that gulls, kestrels, and other sea-birds have the power of poising themselves quite motionless, and therefore to photograph them is not nearly so wonderful as it appears.

Lantern Entertainments.—*Apropos* of explosions at magic (we beg Mr. Dallmeyer's pardon—"optical") lantern entertainments, we remember once being present when there was an explosion, or rather a series of explosions, arising from a cause which it may be said is very rare, but is still likely to happen, even with the most careful and well regulated lecturer. In this instance we may premise the explosions were of the most harmless character, as they were simply confined to the laughter of the audience. The lecturer was expatiating upon a foreign tour he had made, and, to render his discourse more interesting, had it illustrated by lantern slides. Everything would have gone off well had it not been that the operator at the lantern had his own ideas as to where the illustrations should come in, and these ideas, unfortunately, did not quite coincide with the arrangement of the subjects in the lecture. The audience were at first puzzled by a picture of Mont Blanc being described as the Bay of Naples, and the Great Pyramid as the leaning Tower of Pisa, and a few others equally incongruous, but eventually they got perfectly accustomed to these eccentricities, and the chief amusement consisted in wondering what would come up next, especially as the lecturer every now and then appealed to the operator despairingly to be a little more careful. Three or four views absolutely did come right, and then the lecturer, in something like serenity, turned to his manuscript, and as he could not have his eye on the paper and on the screen at the same time, he was obliged to leave his assistant to his own devices, with the result that, while the former was eloquently describing the picture of the Cenci, the latter was calmly exhibiting the portrait of Pius IX. This was too much for both audience and lecturer, and the discourse came to a very speedy end.

At Home.

WITH A PERIPATETIC PHOTOGRAPHER AT ST. CLOUD.

ST. CLOUD is en fête. It is Sunday afternoon, and the broad avenue at the entrance of the park is full of booths and drinking enclosures, gingerbread stalls and shooting galleries. There is a "balle de jour" here, and a "café chantant" there, games of skill and of chance at every step, and warm invitations on all hands to take part in the festivities. It is not very crowded so far, for the Parisians will not come in force till four or five in the afternoon, the bourgeoisie bringing their dinners with them, to be partaken picnic fashion in the sylvan paradise that extends for miles around, and monsieur, madame, et bébé, to patronise one of the boxes of bright red or blue that make such a show in front of the chief restaurant. In the avenue you can scarcely buy a thing straightforwardly; it is indispensable that your skill or luck should be called into play, whether to secure a cigar, a box of bonbons, a handful of gingerbread nuts, or a porcelain vase. In one booth you may win a rabbit, a goose, a goat, or a sheep; all you have to do is to pay a franc, knock down two tiny skittles with a billiard ball, and the sheep is yours. So that there shall be no deception, the live stock is before you ready for inspection and handling—the rabbits, geese, goat, and sheep. But it is only a "mouton" by courtesy; the very tiniest of lambkins, this microscopic "mouton" is hardly larger than its companions the rabbits.

The fête has scarcely begun, and business as yet is rather dull; only at one spot is there a crowd and any show of bustle and interest. Following the law of gravitation, or rather cohesion, we naturally attach ourselves to this crowd, and find the cause of it to be a loquacious photographer. He is in his shirt sleeves, gesticulating, and chattering, and manipulating, while the perspiration rolls off his face in rivulets. A slim blue-bloused lad, and a stout lady who takes the money, and is addressed as Madame, form the staff, and between them they rattle merrily through their work. "Portraits livrables à la minute," says one announcement, while a big placard tells you that 50 centimes is charged for your portrait, and a little placard that the frame costs the same amount. The background is a narrow upright screen, say two feet by six feet, covered with a black fabric, and at this moment there are two young men in the focus of the lens. They have to sit very close in order to come into the picture, and whether the idea has come from the photographer, or has been evoked from their own affectionate brains, they have twined their arms about one another, thus making an effective pose, and conforming to the exigencies of the background at the same time. There is no laughing or joking among the crowd. They are a little noisy and talkative, but they take the matter seriously. The lad cleans the plates and looks after the baths, the chief arranges his models, exposes, and develops. There is no lack of sitters, and the work goes on apace. The photographer moves quickly and speaks glibly. "C'est ça, messieurs," he cries, as he focuses; "tenez vous tranquils, s'il vous plait—c'est ça, cest ça, vous m'interressez beaucoup—mais oui—attendez—un, deux, et trois—fini—à l'autre—le nouveau procédé—rapide-instantané." You heard no more, for our friend's head was already buried in the folds of a dark tent, where he developed his picture.

It was the wet collodion process he employed, notwithstanding all his grand speech, and although he pretended to be exceedingly rapid in his exposures, he cleverly began to uncover the lens before he commenced counting. The plate was developed, fixed, and washed in sixty seconds, and out he came, his face hotter than ever, with a warning to the assembly to make way *au chimiste* and his explosive chemicals. The wife finished the portrait, which consisted in placing it in a half-dry condition in a little frame, and then it was handed, not to the purchaser, but to the crowd in general, for inspection.

In England, no doubt, there would have been a good deal of horse-play practised under the circumstances, and perhaps considerable derision manifest, but here the little picture was criticised *au sérieux*, and the lucky owner a good deal envied. "Tiens, c'est beau;" "Mais, bien bon par exemple." Meanwhile our friend is deftly posing a young lady; she is neatly dressed in black, and has black eyes, and black tresses tightly braided round her head. There is a repose and quietude about her that is in marked contrast to the gaping croud. Again our friend rattles away: "C'est ça, tenez vous droite, mam'selle, s'il vous plait, oui, oui, un peu souriant, mais c'est charmant—un, deux et trois—tire la bobinette, et la chévillette cherra," he cries, quoting Little Red Riding Hood. And before the young lady can well rise, her place is eagerly taken by a third sitter, who has already been preparing for the ordeal. The former model, as the photographer retires to his dark-tent, proceeds leisurely to make her toilet, the crowd being quite at liberty to look on if it pleases. A well-starched muslin apron is drawn on, and the black tresses carefully tucked under a white cap which a friend has been holding the while, and then Mlle. appears as a neat-handed *bonne*, whose counterpart you may see any day in the Champs Elysées; she has no wish to be photographed in her robes of office, thank you! In two minutes more the portrait is in her hands, and she goes away happy.

In company with the rest of the bystanders, we got an opportunity of criticising these little pictures; they were positives on glass, taken well enough, and with all that delicacy which the wet collodion plate shares with the Daguerreotype. During half-an-hour we timed our hard-working brother, and found that he secured seven pictures, the first, a group, being paid for extra. No doubt there was little profit to be made out of the fifty centimes charged for the portrait, but then the frame, of course indispensable, was not probably worth a fifth of the fee asked for it. Gelatine plates of the smallest size he could have purchased—in this country, at any rate—at about three-halfpence a piece if he went to the cheapest market, but probably his collodion plates did not cost him more.

If you possess a negative already, the quickest way of making "portraits livrables à la minute" is to adopt the plan suggested a short time since by Mr. Werge. This is to employ gelatine plates for the impressions. You simply place a gelatine film behind the negative, show it to a gas flame for thirty or forty seconds, and then develop as for a transparency. You must employ the oxalate developer to avoid any brown tint in the film, and after the latter has been washed, but while yet moist, a piece of white enamel paper is clapped behind, and the whole put into a frame. Enamel paper of the proper kind is a commercial article, and can be readily purchased, and when once pressed against the moist gelatine film, it adheres very tenaciously. Our photographer, however, knew nothing of gelatine, and had never vexed himself, doubtless, with the troubles of oxalate and bromide development. His process was quite novel enough to secure custom, and he was satisfied. The dark slide came out and went into the little developing box with surprising rapidity, and it certainly was an instantaneous process under his hands. No doubt we saw our friend at his best, but if he worked for a few hours at that rate he could make a tolerable week's income during the afternoon. The camera, lens, and dark box did not form a very costly stock-in-trade, but the man must have been a skilful photographer to work so quickly and without a hitch. It was impossible to foist a failure upon his customers under the circumstances, for madame handed the pictures direct to the critics, who appeared to consider it their right to pass judgment thereon. The little plates were dried as soon as possible, fitted in their bright frames, and exchanged for coin. Many of our readers would doubtless be surprised to hear what the takings of a wandering photographer are on a good day, but

in the case of competent men the amount must sometimes be considerable. We were listeners the other day to a humorous story of adventure of two young amateurs who visited Hampstead Heath on Easter Monday last, more for the sake of fun than anything else, and whose gains during the day amounted to no less than three pounds fifteen shillings.

There was one question we felt inclined to address to our St. Cloud friend before parting; namely, whether he was the lucky travelling photographer who passed through St. Germain the day before Adolphe Thiers died, and who was so fortunate as to obtain the ex-president of the French Republic as a sitter. The negative taken on that occasion brought its owner no less a sum than three thousand francs, since, naturally enough, it was the last photograph secured of the great statesman before he died. The picture was reproduced in every illustrated journal throughout France, and the *Illustrated London News* copied the photograph. Was our St. Cloud photographer this fortunate individual, we wonder!

The next "At Home" will be "At the Royal Observatory, Greenwich."

FRENCH CORRESPONDENCE.

M. Janssen on Photographing the Solar Photosphere—Process of M. Chardon for Producing Plates in Pellicle—New French Patents by MM. Pierre Petit, Blair, and Lenoir.

Photographing the Photosphere of the Sun by M. Janssen.—At the meeting of the Académie des Sciences, on the 5th July, M. Janssen read a paper on the effect of light in reversing the photographic image. He seemed to think that by this means a photograph could be obtained of the chromosphere. "The luminous action of the sun," he said, "must be continued long enough for the silver image to become positive up to the circumference, but without passing beyond it. The chromosphere will then be observed in the form of a black ring, with a breadth corresponding to about 8″ or 10″. I have compared positive and negative images of the sun taken on the same day with the same instrument, and the measurements of their diameters show that this black ring is outside the solar disc. This result I submit, however, with great diffidence, as more extended investigations are certainly necessary to corroborate it." I have seen the images of which M. Janssen speaks, but I must confess I have my doubts as to the correctness of his views. It seemed to me that the extra solar disc to which he directs attention is nothing more nor less than the luminous field of the lens. This black disc—or, to describe it more correctly, this black ring—has no peculiarity by which it can be distinguished from the impression caused by a luminous field. Evidently the whole of the solar disc is photographed to its full extent, and the black ring which surrounds it can, therefore, be only visible outside it. If M. Janssen has a strong reason for believing that this annular impression is something else than that of the field of the lens, my own humble opinion must doubtless bow to it; but I may be allowed to point out that he has entered on investigations where the greatest nicety is necessary, and where every care must be taken to guard oneself from illusions. Scientific men who bring to their work the zeal and talent of our illustrious astronomer are subject to fits of enthusiasm, and are sometimes prone to accept dreams as realities. My great desire is that it may not be so in this case; and I wait with impatience for further facts of a less doubtful kind—facts which a conscientious observer like M. Janssen will have no hesitation in asserting to be real—before giving in my complete adhesion to the opinion that the black ring which surrounds the photograph of the sun is something else than merely a luminous irradiation.

M. A. Chardon's Pellicular Plates.—The following method for obtaining pellicular plates as supports of gelatino-bromide films is recommended by M. Chardon:—Glass plates are first coated with ordinary collodion, made to adhere firmly by covering the edges of the plates with a varnish of caoutchouc dissolved in crystallised benzine. On this is flowed the film of bromized gelatine in the usual way, and the plate having been developed, fixed, &c., the surface is again covered with a layer of collodion more or less thick according as it is purposed to make use of the two sides of the negative to take positive impressions, or only of one side. When the collodion layer is dry, it is cut round the edge with the point of a penknife, and the pellicle can then be stripped off the glass. It will be seen that this pellicle consists of a film of gelatino-bromide between two layers of collodion. This method itself is exceedingly simple and effective. The impressed film lying between two layers of collodion is neither subject to be affected by moisture, nor liable to be scratched, and the negative image is thus completely protected. In order to prevent the plate from twisting either to one side or the other, I would suggest that the collodion employed for the two layers should be of the same density. M. Chardon's process is especially adapted to cases where the negative has to be inverted; the inversion can be effected by this means with less risk than by any other method.

New Photographic Patents in France.—My readers in the Photographic News may perhaps be interested in learning some particulars of the patents recently taken out in France for photography, and I propose on this occasion to give the first instalment of this kind of intelligence. M. Pierre Petit, under the date of the 25th February, has taken out a patent (No. 134,412) for a "process for taking by photographic relief printing transparent images called *Photophanies*." There is nothing remarkable to note in this patent, except it be the increasing tendency of some people to be continually taking out patents for the same thing. The process in question is, in my opinion, nothing else than a variation, if it be not an exact copy, of the one of the same kind which has been already patented by M. Poitivin, Mr. Woodbury, and others whose names are unknown to me. In his patent M. Petit contemplates a gelatine plate in relief, against which is pressed the substance which is to receive the image. To take an impression in fatty inks, he interposes a sheet of caoutchouc. Under the date of the 6th Feb., M. Blair has patented (No. 134,937) an improved apparatus for dry collodion photography. It is a sort of changing box placed above the camera, and the plates are kept in their places by a system of spring clips. To work it, the operator is obliged to introduce his hand into the box, for which purpose the camera is provided with a sleeve. It is nevertheless a doubtful question whether an apparatus of this kind can be effective with plates which have the great rapidity of gelatino-bromide. The sensitive plates drop into the camera through an aperture which is made to fit into one in the box; and to remove them again after they have received the impression, the hand must be inserted into the camera through the sleeve. A third patent that I have to mention is that by M. Lenoir (No. 129,317); it relates to a system of photographic engraving which he calls *typo-photographie*. The material which he uses for protecting the metal is bichromated gelatine or albumen, instead of bitumen of Judæa. After insolation the metal plate is plunged into a bath of alkaline water until the denudation is complete, and then it is washed, dried, and finally heated to 100° C. It is next dipped into a solution of potassium or ammonium bichromate with some sulphate of ammonia, exposed to the light, and then heated to about 150° C. It may also be made to absorb a solution of gum-lac, or some kind of resin, as a substitute for the bichromate, for all these substances render both gelatine and albumen more or less proof against the action of acids. In this state the plate is ready to be etched by the acid;

but before doing so it is advisable to pass over it with a brush a thin layer of varnish mixed with carbonate of lime, or, still better, a solution of bitumen of Judea in turpentine with some carbonate of lime. When this layer is dry, the plate is immersed in the acid bath, which is composed as follows:—

Water	10 litres
Oxalic acid	50 grammes
Alum...	500 ,,
Nitric acid	200 ,,

After an hour's immersion the plate is washed, and may then be mounted to serve as a typographic plate. This method of M. Lenoir, however, in which he uses a layer of gelatine, seems to be more complicated than the simple and direct process with bitumen of Judea. As occasion arises, and I have space, I hope to be able to entertain my readers with the specification of other patents.

Leon Vidal.

GELATINE DEVELOPMENT.

BY H. BRUYERE.

Messrs. Marion, in their formulæ accompanying their dry plates, describe a very efficacious method of development; but why do they advocate the clumsy proceeding of having two solutions of pyrogallic when one will do, and one of the solutions labouring under the disadvantage of not keeping?

The following solutions can confidently be recommended, not only with respect to their keeping qualities, but also for the facility and certainty of conferring density, combined with the extremely simple method of developing in a well dish, which carries with it the great recommendation of freedom from stains upon the hands, so difficult to move, and so unsightly to sitters. Take—

Pyrogallic	48 grains
Ammonium bromide	46 ,,
Water	1 ounce
Nitric acid	1 min.

Mix the water, bromide, and nitric acid, then the pyrogallic. If an ounce of pyrogollic is mixed at once, take—

Water	10 ounces
Ammonium bromide	640 grains
Pyrogallic	1 ounce
Nitric acid	10 min.

Mix them as above described. The last solution is slightly weaker in pyrogallic, but not to any detrimental extent. The ammoniacal solution is

Strongest ammonia	1 drachm
Water	20 ounces

When about to develop, use a two-ounce measure, drop in for a quarter-plate half a drachm of the pyrogallic solution, then fill up to the two-ounce mark with the diluted ammonia; pour the solution in the well, place the plate in the upper part of the dish, and let the developer flow over the plate in one wave. It is to be observed that the plate is not, previous to development, placed in water to moisten it; a well dish facilitates the flow of the developer in an ordinary dish; without previously wetting the plate, the gelatine film is inclined to repel the solution of pyrogallic. The image will appear with nearly the rapidity of a wet plate. To obtain the necessary density, the plate is left in the solution (gently rocking it) till this is judged satisfactory, which is generally decided by the appearance of the image at the back of the plate; the plate is then well washed, and placed in the fixing solution. If the plate is known to be under-exposed, add half as much again of the ammonia solution. Although the forcing up of the picture by ammonia covers the shadows with a peculiar veil, fatal to the production of brilliant proofs, the remedy ought to be in the exposure, and we take a great objection to the indiscriminate use of the ammonia solution, for we are strenuous supporters for the rigid measurement of the developer. For example, no operator would be constantly changing his ferric solution when used in the wet process, and we conceive the uncertainty connected with dropping unknown quantities of ammonia in the pyrogallic is a fertile source of failure, from the difficulty of knowing whether the want of success is due to the excess of ammonia, or error of exposure; but by having the solutions of a recognized strength, combined with some accuracy of measurement, the operator has a foreknowledge of the behaviour of the developer, and is sure that any fault can only be due to imperfect exposure; this is under the supposition that the plates are approximately perfect, for by eliminating the uncertainty connected with the developer the estimation of the exposures becomes more reliable, for to this correctness success is mainly due. No doubt all those adventitious aids to obtain density, such as the use of the colloids, sugar, &c., will fall into disuetude, curiously following the judgment passed upon their application in the wet process, that although they may be useful for specific purposes, the general routine of practice has determined against their usage.

THE CHANGES WHICH GELATINE UNDERGOES IN EMULSIFYING.

BY DR. J. M. EDER.*

The changes which gelatine undergoes in the preparation and keeping of emulsions are very various.

1. When it is boiled for a long time, gelatine splits into two substances—semi-glutin ($C_{55}H_{85}N_{17}O_{22}$), which is precipitated by platinum chloride and is insoluble in alcohol; and hemicollin ($C_{47}H_{70}N_{14}O_{19}$), which is not precipitated by platinum chloride, and is soluble in alcohol. Semi-glutin, by standing, reduces silver nitrate without precipitating it. Hemicollin produces a curdy precipitate of silver nitrate. This splitting up of the gelatine is the cause of gelatine, after long-continued boiling, being unable to set. In this stage, however, no decomposition is set up, for the latter only appears after boiling for several days, rendering the gelatine quite fluid; but boiling for half or even a whole hour has no injurious effect.

2. If the mass be kept for a long time at a temperature of from 30° to 50°C., the gelatine becomes equally incapable of setting, but at a later period than in the former case. It is very difficult to decide the exact point when putrefaction—shown by the development of gas, and formation of ammonia in combination—begin, and the separation above alluded to ends.

3. Boiling with even a slight addition of ammonia, or of an acid, quickly deprives gelatine of its power of setting, and the same splitting up appears to occur. Gelatine warmed with water containing 1 or 2 per cent. of ammonia at a temperature not exceeding 40° C. will, after the lapse of three hours, be found to have the temperature of its setting point lowered 1° or 2°. The fixed alkalies have the effect of decomposing the gelatine when boiled with them. Acid potassium bromide deprives the gelatine of its capability of setting much quicker than the neutral bromide; this might be foreseen from what has been already stated.

4. The incapability of setting produced by continued heating at 30° to 40° C. is almost always the result of a process of decomposition. Germs of putrefaction are always present in the atmosphere, so that no artificial ferment is necessary. Decomposition is very quickly set up by the addition of a small quantity of animal tissue—for instance, muscular tissue, or, still better, the substance of the pancreas—to the gelatine solution, and digesting it over heat. In this reaction, according to Nencki, there are formed from every 100 parts of gelatine, 9·48 parts ammonia, 24·2 parts volatile fatty acids, 12·2 parts glycocoll, 19·4 parts peptone, and 6·45 parts carbonic acid. The gas developed does not consist of carbonic acid alone. The volatile fatty acids are acetic, butyric, and valerianic acids, the first of these being the more abundantly present in proportion as the process of decomposition is prolonged. The ammonia is combined with the fatty acids and remains in the solution.

* *Photographische Correspondenz.*

In order to obtain an insight into this process of decomposition in various kinds of gelatine, when heated to from 30° to 40° C., I induced Herr Recht to undertake a series of experiments. For this purpose twelve different sorts of gelatine were submitted to the conditions above described. We took these different gelatines from samples by Nelson, Heinrichs, Creutz, Coignet, Fischer and Schmitt; the remainder were of unknown manufacture.

First let me mention that the commencing reaction varied in the different sorts. The gelatines of only two separate manufacturers were alkaline, the remainder were distinctly acid. The point is of importance, because on it depends the development or non-development of free ammonia during long-continued heating.

1. *Nelson's No* 1.—Reaction at first alkaline; after three or four days' digesting, development of ammoniacal fumes rapidly increasing.

2. *Nelson's No.* 2.—Same as No. 1.

3. *Nelson's Opaque.*—Same as Nos. 1 and 2.

4. *Fischer and Schmitt's Emulsion Gelatine.*—At first alkaline; after three days fumes of ammonia, as in Nelson's gelatines.

5. *Fischer and Schmitt's Collotype Gelatine.*—At first slightly acid reaction; the end of nine days gave off ammonia.

6. *Heinrich's* (*Mark* W. H.) *Collotype Gelatine.*—At the beginning acid; at the end of even a fortnight's continued stewing, gave no sign of free ammonia.

7. *Heinrich's Softer Kind.*—Reactions the same as in the previous instance.

8. *Creutz* (*Mark* F. C. F.)—A firmer kind; gives a yellow filament. Reactions the same as those of the two former numbers; remains acid after fourteen days' digesting.

9. *Creutz's* softer and more opaque sort, with a white filament. Reaction same as the last.

10. *Coignet's.*—Reactions as in the previous cases; remains acid.

11. *Manufacture Unknown.*—White and very fine gelatine. Acid reaction at the outset, and remains so after fourteen days' digesting.

12. *Manufacture Unknown.*—White and very fine gelatine. Also continued to have an acid reaction.

In our experiments, therefore, only those gelatines which had at first an alkaline reaction gave ammoniacal fumes after long-continued cooking; those whose reaction was at first distinctly acid showed no sign of free ammonia, even after fourteen days' digesting, and longer we did not carry on the experiment. In one case only a gelatine which had at first a slightly acid reaction lost that reaction after nine days' stewing, and then became ammoniacal. We also proved that a gelatine which had been fined with a large quantity of white of egg turned alkaline much quicker, and lost its power of setting much sooner, than if it had not received an addition of that substance. I therefore am unable to recommend the addition of albumen for clearing gelatine.

We can thus see, that after a gelatino-bromide has been digested for several days at a temperature of from 30° to 40° C., ammonia will be developed if an alkaline gelatine has been used. Now, as we know, ammonia, on the one hand stimulates the sensitiveness, but on the other promotes the decomposition of the emulsion; hence, those sorts of gelatine which have an alkaline reaction are only to be employed with the greatest care in making emulsions requiring a long cooking, especially as there is no means of estimating the amount of ammonia which is gradually produced. In all cases, therefore, where the action of ammonia is not desired, an acid gelatine should be used, as well as when the emulsion is to be boiled. When ammonia is actually wanted it is better to add it directly to the emulsion, and then it will be possible to check the length and intensity of its its action.

The sensitiveness of a gelatino-bromide emulsion is increased not only by long-continued heating, by which the gelatine is partially decomposed, but also by boiling for not more than a quarter of an hour, when no alteration of the gelatine can be observed. Still more decisive is the fact that an emulsion of gum-arabic will also be made more sensitive both by long digestion at a moderate temperature, and by boiling for a short time. Now gum-arabic does not alter in boiling; we may conclude, therefore, that in all these cases the increased sensitiveness is due to a change in the physical condition of the silver bromide.

Another factor in the attainment of increased sensitiveness may possibly be the degree of porosity of the gelatine film. Substances which have a tanning action—for example, alum—make the film leathery and impervious, and a less sensitive plate is the consequence. Under ordinary circumstances, however, I do not think that this difference is sufficiently acute to become observable in practice. At any rate, I have not remarked any great difference in this respect between a hard collotype gelatine, and a soft and fine gelatine, though the comparative toughness of the two was just as sharply marked after they had been heated in the usual way with ammonia.

As the result of these experiments, therefore, I would recommend the following points, to which attention should be directed in choosing a gelatine for emulsion purposes:—1. When ammonia is not to be used, the gelatine should have an acid, not an alkaline reaction; when ammonia is used, this is a matter of indifference. 2. Ordinary collotype gelatine may be taken, but that sort is to be preferred which gives the clearest and hardest jelly, and soaks up very little water. The gelatine must be free from fat, otherwise there will be depression in the film, and bright spots with blurred outlines in the negative. A gelatine of this kind is, however, often employed when the emulsion is prepared with the addition of ammonia; in this case the fatty matter is probably saponified, and the spots will disappear.

Gelatine films on glass have occasionally a very awkward habit of expanding when heated with water, especially when the water contains salts in solution. In this case they are liable to form folds and frills, to spring off the glass, and to occupy more space than they did at first. As the cause of this phenomenon does not appear to be accurately known, I may be allowed to give the result of some of my own observations, which may probably throw some light on the subject.

Frilling and stretching of the gelatine film is promoted—1, when it has been coated thickly on the glass; 2, when the gelatine used sucks up a large proportion of water; 3, when the emulsion has been digested for a long time over heat (less so when it has been digested with ammonia); 4, when the gelatine contains gum-arabic. The first of these faults can be cured by coating the plates more thinly, the other by the addition of chrome alum or of alum to the gelatine emulsion,* or by bathing the plate, before developing, in a cold saturated solution of alum. The latter method is generally efficacious, if the plate be plunged into the bath, and directly used in the wet state; when the case is a difficult one, the plate, with the film tanned in alum, should be rinsed and then dried. By these means the absorbtive power of the gelatine for water is much diminished.

It is worthy of note that an otherwise excellent gelatine will often possess this fault when it contains a gum—like gum-arabic—soluble in water, or even some gummy substance, as is gelatine, which has been altered by long-continued heating. Possibly there may be a change in the diffusive relations, and a gelatine will be more especially liable to expansion and frilling when a developing solution containing salt is removed from it by washing in water.

* In this case glycerine may, with advantage, be mixed with the chrome alum. The best way is to add, to every 500 parts of emulsion, five or six parts of the following solution:—20 parts chrome alum, 450 parts water, and 200 to 240 parts glycerine. When the emulsion has been mixed with alum it must at once be all used up, for when once set it will no longer dissolve freely in hot water.

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GELATINO-BROMIDE NEGATIVES FOR PHOTO-MECHANICAL PRINTING.

The gelatino-bromide process is undoubtedly pressing itself forward with great strides; and though it may not be destined to completely rout and expel the bath and wet plates, there can be no doubt that the new method is, at the very least, able to take a firm stand side by side with its elder and finger-blackening brother. Two years ago the gelatino-bromide process was in the hands of a few, and the excellence of the results which they obtained was commonly attributed to special experience rather than to the inherent merits of the process itself. Now the case is altogether different, and a pushing London photographer who is not capable of obtaining first-class results on gelatino-bromide plates would perhaps be hard to find. As soon as the general run of photographic workers discovered that excellent results were yielded by the new process, even when in the hands of men who, like themselves, had but little time for experimental work, they went in for the new thing, and succeeded. All kinds of dismal forebodings were heard as to the ruthless manner in which the hot weather would punish those progressionists who were so daring as to throw over the bath and take to gelatine; yet, although it is now summer, the difficulties incident to the new order of things are steadily diminishing. Frilling or blistering, which was looked on as such a formidable enemy, is now rarely heard of, as the conditions for preventing it are now pretty thoroughly understood, both by plate makers and plate users.

Those who practise the various photo-mechanical printing processes appear to be rather slow to adopt the new mode of working as regards the production of negatives; but the purpose of the present article is to point out the special adaptability of the gelatino-bromide process to the requirements of the photo-mechanical printer. For the ordinary photo-lithographic processes, in which the original fatty image is prepared on a sheet of gelatinised paper, a direct negative of considerable vigour and intensity is required. To obtain a suitable negative of a sharp or clean line subject is a matter of the greatest ease. A sufficiently long exposure to render all forcing with ammonia unnecessary should be given; and either a normal developer, or one containing a slight preponderance of pyrogallic acid, should be employed. If the plates employed are of a kind tending towards the production of thin images, the proportion of pyrogallic acid must be somewhat increased; but in such a case it may be necessary to prolong the exposure to a certain extent, lest the transparent portions of the negative should become tinged by the stain almost invariably produced when the development is unduly prolonged. As a general rule, three or four minutes is sufficient for the development of a dense negative of a line subject. Apart from chemical causes, there are three circumstances which may tend to mar that extreme clearness of the lines which is to be desired. These are, reflection of light from the back of the plate, commonly called halation; reflection of light by the black lines of the subject; and reflection from the surfaces of the lens employed. The first of these, or halation, rises into importance on account of the large proportion which white bears to black in the case of most subjects intended for reproduction by photo-lithography; and it not unfrequently happens that very fine hair-like lines extending over a white ground are almost totally obliterated by this agency. It is therefore advisable that backing of the plates should be resorted to whenever fine work is to be reproduced, or when the scale of reduction is considerable. The amount of light reflected from the black lines of the original is often considerable, as the blacks of an engraving frequently lack solidity, and show as a kind of stipple under a magnifying glass, but in such a case the operator can hardly mend matters. When an ordinary actinised meniscus is employed, the reflection inside the lens is altogether insignificant, but it occasionally happens that reflection from some portion of the tube or mount degrades the image. In such a case the remedy is obvious, and it is a good precaution to varnish the edges of the lens with black varnish. Nowadays, however, the old-fashioned view lens is not so much used for copying as it deserves to be; as in order to reduce the distortion to a minimum one must employ an objective of very long focus in relation to the working area. The short focus doublets and triplets now so generally employed present numerous reflecting surfaces, and in some cases the light so reflected considerably degrades the purity of the image. All that a person using such a lens can do is to blacken the edges of the glasses, and to provide against any possible reflection from the metal-work of the instrument, let us say by lining the tube with velvet or other means. The diaphragm slit must of course be looked to, as during a long exposure a very small trace of light entering here might do much mischief.

Negatives intended to be printed by the collotype process must be reversed, and when line subjects are to be reproduced by the method in question no unusual density is requisite, so that our remarks on this point may be confined to the production of the negatives in a reversed form. Should the operator be possessed of a reflecting prism or true-surfaced mirror which he can adapt to the front of the lens when he takes the original negative, the production of a reversed image is effected without trouble, only a slightly increased exposure being needed. Supposing that the operator does not possess a suitable reflecting instrument, either one of two courses is open to him for the production of a reversed image. He may place the plate with the glass side next the lens, or he may strip his negative from the glass plate after it is finished. Should the former plan be adopted, a plate quite free from irregularities should be selected, and it is needless to say that the back of the plate ought to be very carefully cleaned. Fairly satisfactory results may generally be attained by this method; but when results of the first order are required it is better to strip the gelatine film. We have found the following plan to answer perfectly for this purpose. A plate of flashed ruby glass is cleaned on the coloured side just as one would clean a plate for the ordinary wet process, and after this a little powdered French chalk is gently rubbed over the surface by means of a soft cloth. All excess of the French chalk having been wiped away, the prepared surface is bordered with a solution of india-rubber in chloroform; six grains to an ounce of solvent being a convenient strength for this latter. The next step is to coat the plate with plain collodion containing about five grains of pyroxyline to an ounce; and if this collodion leaves a film of a horny character, so much the better. The collodion film being dry, all is ready for coating the plates with emulsion, and the emulsion films may either be allowed to become dry, or they may be exposed in the moist condition as soon as the gelatine has set; but in this latter case there is no necessity to wash the emulsion unless the greatest extreme of sensitiveness is required. In either case the negative is developed, fixed, and washed in

the usual way; and it will be found that the use of ruby glass for a support has acted as a most perfect preventive of halation or blurring. Now with regard to the stripping of the films, a piece of rather thick sheet gelatine is soaked in cold water until it becomes quite flaccid, after which it is laid on the face of the negative, this having been previously well flooded with water. The sheet of softened gelatine is now brought into thorough contact with the film by means of a squeegee; and this having been done, the next step is to clamp the edges of the gelatine to the plate by means of four strips of wood, held in position by means of American clips. When the compound gelatinous film is dry, it is merely necessary to cut through it, just within the india-rubber border, and to lift one corner by means of the point of a penknife, when it will be found to leave the glass with ease. As regards the class of negative required for general collotype work, all that it is necessary to say is that it should not be unduly dense; while the new Woodburytype process is best worked from a negative rather tending toward density. The newest Woodburytype process, in which the gelatine relief itself is printed from, and also the Pretsch process for producing deep plates, necessitate the use of a transparency which reads reversed when the film side is next the eye. Such a transparency would be produced by contact printing from a reversed negative, or by copying a direct negative with the camera, the film of this negative being turned from the lens.

Notes.

Photography cannot lie, neither can the leopard change its spots; but, says Artemus Ward, referring to the latter circumstance, you can change them for him. We fear that a good many tricks are in like manner played with photography. In many of the chemists' and hair-dressers' shops in Paris may be seen a duplicate portrait of a young lady, on the one side with a face covered with freckles, on the other with features as smooth and soft as a peach. The latter effect is due, we are told, to repeated applications, by the freckled young lady, of *eau de fée*, or fairy water. Certainly no better proof could be afforded of the efficacy of *eau de fée* than this unbiassed photographic record, and if one was not acquainted with the powers of a retouching pencil, it would be a great temptation to buy some of the wonderful lotion. We did not ourselves go as far as that, being under the impression that, notwithstanding the effect to the eye, the leopard's spots—or, rather, freckles—were still underneath the covering of white-wash.

Another example is yet more startling, and here, apparently, there is no deception. The photograph is shown of a gentleman with a splendid head of hair, and a beard of luxuriant growth, and beside it is another portrait of the very same gentleman, but with his head perfectly bald, and no beard at all. It is a wonderful hair-wash that has done this, for a label in the window tells us so. The bald-headed gentleman had simply to apply the wash for a short time, and ambrosial locks and stately beard were the consequence. It is a long time before we can tear ourselves from that window, and as we go on our way we are still wondering how much the photographer must have paid that gentleman before he consented to shave his head and beard like that.

M. Janssen is continuing his experiments at Meudon with reversed images. By exposing his plate in a solar camera many hundred times longer than usual, he is enabled to get a graduated reversed image of the sun, which permits him to study the chromosphere with advantage. The exposure is continued until the solar image is positive to the border, and the chromosphere then appears as a dark circle, eight or ten inches in width, instead of like a luminous halo, as we are accustomed to see.

A simple way to demonstrate the reversing action of long-continued exposure is to print a gelatine plate under an ordinary photometer or sensitometer. If the Warnerke sensitometer is employed—which is graduated in squares from 1 to 25—and a gelatine film of ordinary sensitiveness is put under it in a printing-frame, and exposed to diffused daylight for about three minutes, a very interesting result may be obtained. From 1 to 15 the figures are decidedly positive or opaque, in other words, reversed; in 16, 17, 18, 19, the figures are semi-transparent, with a rim of black round them, the rims being very marked in the first numbers. In the last squares of the series, 21 to 25, the figures are transparent, or distinctly negative. Thus it is possible to secure positive and negative images upon the same plate, together with the interesting phenomenon of transition. The experiment is so easily made, and is so curiously illustrative of the reversing action of light, that we earnestly recommend it to our readers.

If, instead of exposing the gelatine under the Warnerke sensitometer for three minutes in diffused light, you permit an exposure of double that period in a strong light, your developed image then presents a phenomenon of an opposite character. Squares Nos. 1 to 5 are now represented negative transparent figures on an opaque ground, while the figures 20 to 25 are opaque upon a transparent ground. We have once more gone back again, in fact; only with such very long exposure the plate develops almost clear glass, the developer being so impotent that the same result almost may be secured by immersing the film directly in hyposulphite solution.

Russia has at last started a photographic journal. The first number of "Photography," as it is called, has just reached us from St. Petersburg, where it is published. Russian photographers have occupied so high a rank, it is curious they should have hitherto been without an organ.

Applications for space to exhibit in the Ghent International Photographic Exhibition should reach the Secretary, M. Varenburgh, this week; nay, they ought to have been addressed to him before the 20th of this month. The pictures themselves must reach the Palais de l'Université, at Ghent, not later than the 20th of August. This exhibition, which is under the patronage of the King, will include exhibits of all nationalities. But there is, it appears, at the National Belgian Exhibition, now open in Brussels, also a display of photography by Belgian artists alone.

A German band in full blast, with its surrounding of maid-servants and perambulators, street boys and loafers, was the result of a snap shot by Mr. William England the other day from his window in St. James' Square, employing for the purpose his well-known drop shutter.

The picture opens a wide vista of the possibilities of gelatine plates. Every London street-scene can now be pourtrayed without difficulty. What wonderful things, too, we may expect to find this year at the Exhibition at Pall Mall! The medals will not be so easily gained as hitherto.

There will be a change in photography similar to that which marked the advent of small-bore shooting at Wimbledon, the year after the so-called "gas-pipe" was discontinued. There was at once a very perceptible jump in the scores of the marksmen. So it will be at the Annual Exhibition this Autumn, now everybody employs gelatine and shoots with a drop-shutter. Instantaneous pictures will no longer be confined to gulls and swallows.

Topics of the Day.

REVERSAL OF THE PHOTOGRAPHIC IMAGE.

BY CAPT. ABNEY, R.E., F.R.S.

M. Janssen is a distinguished French physicist, but can scarcely lay claim to be "au courant" in photography, since he has lately announced to the Academy at Paris that he has discovered what is called a *new* phenomenon in our science, viz., a reversal of the developed photographic image on a gelatine plate, caused by prolonged exposure. He also states that he has obtained photographs of the chromosphere by the same method. Our readers will scarcely be prepared to allow the phenomenon the title of "*new*," unless they are Rip Van Winkles. Anyhow, it may be of interest to discuss the matter from a point of view already made known in these columns by myself.

If I am followed mentally in a couple of experiments (and if they are repeated practically so much the better), the reversal of the image, as observed by M. Janssen, will be very apparent. Take three gelatine plates—whether bromide, bromo-iodide, or chloro-bromo-iodide, it does not matter—and expose them to daylight for a couple of seconds. When thus treated, allow the spectrum to fall on them for one minute—one plate being immersed in a glass cell containing a quarter per cent. solution of bichromate of potash; the second in plain water; and the third in a quarter per cent. solution of *nitrite* of potash, and develop them with the alkaline or ferrous oxalate developer. After fixing, note the result. The first, which is immersed in the bichromate solution, will have a reversed image of the spectrum throughout its length, the signs of reversal being strongest in the red and ultra red of the spectrum, least in the yellow and ultra-violet, and of a medium character in the blue and violet. The second photograph will show a slight reversal in the red, and nothing more; whilst the last plate, which is exposed in a bromine absorbent, will show the spectrum in its usual character, fogged to a slight extent by the preliminary exposure, no appearance of the ultra-red end part of the red regions of the spectrum being visible. What we learn from this is, that the reversal is due to oxidation of the subsalt of silver formed by the preliminary exposure, the oxidation taking place most rapidly in the red, and then following the order given above.

If the strength of the bichromate solution be increased, there will be no signs of any image on development, since all the subsalt will have been oxidized independently of the aid by light The simple water has no effect on the plate; whilst the bromine absorbent renders any effect of reversal impossible. A plate exposed in the ordinary manner to the spectrum will only exhibit reversal after a very prolonged exposure. If plates be exposed in a similar way behind a negative, giving a preliminary exposure, the same reversal of the image will be obtained if the light acting on the latter be white, blue, or red light, confirming the fact that the subsalt of silver formed by the preliminary exposure is sensitive to all radiations. If a plate be dried after immersion in bichromate, as practically carried into effect by Mr. Bolas, the same phenomena ought to be observed. Now the point to which I wish to call attention is this, that M. Janssen, by using plates containing no oxidizing agent, such as bichromate, is absolutely losing the full power of producing reversed solar images. The time taken to impress the reversed image on a wet bichromated plate is but little longer than required to produce it unreversed. The omission of the oxidizing agent makes it necessary to give an exposure of at least 100 times that amount.

I should like to have said a word or two about the chromosphere, which he apparently thinks he obtains unreversed; but it is a dry subject for most readers. Suffice it to say that what is supposed to be the chromosphere is, in all probability, another "new" phenomenon called halation, produced by over-exposure. I may, however, mention one fact which may be of interest, regarding some pictures, which is this. When employing the albumen beer process, if too short an exposure were given, and only a faint image appeared, I have often opened my dark room window, and allowed a flood of white light to fall on the plate, the result being the formation of a positive instead of a negative picture of the sun. The explanation of this is to be found from the experiments above quoted. After the great success attaching to Mr. Bolas's method of utilizing this reversing action, it seems almost impossible that his process should be dormant for long. The promise of the process, too, is increased by the fact that whether red or white light be employed, the same results may be obtained. It is also well to mark that after a plate has been exposed in the camera it should not be allowed to see light of any description more than is absolutely necessary, since from the moment that it is in the presence of such a light, a *slow* oxidation and enfeeblement of the image commences. This oxidation of the image is with the greatest difficulty carried out in the case of *dry* gelatine plates in the dark, but with simple collodion emulsion plates it is much more rapid, as many know to their cost.

The "Topic" for next week will be "Old and New Formulæ for Collographic Printing," by Adolphe Ott.

NELSON'S GELATINE.

BY J. R. JOHNSON.

Few substances are more important to the photographer, or occupy more of his attention at the present time, than gelatine, which forty years ago was unknown as an article of English manufacture. At that time, when jelly was wanted for an invalid or for other household purposes, it had to be made from calves' feet; from hartshorn shavings, the "cornua cervi" of the pharmacopœa; or from the swimming bladder of fishes, that of the sturgeon being largely imported from Russia in a dried state under the name of "isinglass" for the purpose of making edible jelly.

In 1839, the high price of isinglass, due to the great demand for that article and its relatively limited production, induced two gentlemen of the then little town of

Leamington—the late Mr. George Nelson, a practical chemist, and Mr. T. B. Dale (at present one of the most highly respected inhabitants of Warwick)—to undertake the manufacture of pure gelatine as a substitute for isinglass, and after great difficulties an article not only equal to the natural in appearance, but greatly superior to it in chemical purity, was ultimately produced. This was offered to the public, and offered for a long time in vain, for it was not until after six years of perseverance, and in spite of repeated rebuffs which would have wearied less persevering men, that the manufacture became self-supporting, and moderately remunerative.

"Nelson's gelatine" is now a household word, and, in its little yellow packets, has become indispensable in the kitchens of Great Britain, and scarcely less so in the United States, where it is largely sold, packed in little pasteboard boxes under a red cover.

As Nelson's photographic gelatine is that very generally preferred by photographers, and as Professor Eder, the great authority on the subject, gives it a high place in his list of gelatines fit for photographic purposes, we felt a strong desire to pay a visit to the source from which this article is derived, believing that a description of what we should see there must necessarily interest our readers. We persevered in our intentions, notwithstanding the very modest disclaimer of one of the principal members of the firm, who assured us that "there was nothing to see or learn in their manufactory from a cursory examination; that the commercial process of making gelatine was similar to that of the cook in making jelly, except that the vessels were very large, and that the mechanical parts of the process were performed by machinery; that even the material was almost identical, the skin of the feet and head of the ox being substituted for that of the calf." Indeed, it would appear from the very interesting information communicated to us by Mr. E. W. Nelson, who is an educated chemist, that the more hardy and vigorous the animal, the more perfect the gelatine resulting from the treatment of its hide, inasmuch as not only is the skin of the adult animal preferred to that of the young, but the hide of the buffalo, or semi-savage ox of the South American Ranchos, is found superior to that of the English Devon or Shorthorn.

In France, gelatine is produced from a totally different source, and in a different manner. Bones contain a large amount of gelatine combined with phosphate of lime (bone earth), and these are the chief source of gelatine in France, the earthy matter being dissolved out by hydrochloric acid, and the gelatine set free by the acid being disssolved by boiling after long washing in water to remove the last traces of the acid. It is alleged that these are only removed with the greatest difficulty, and if we may rely upon the lately published researches of Professor Eder, already quoted, that result is rarely attained, for he found acid present in all the specimens he examined except those of Nelson.

This and much other information was communicated to us by the obliging gentleman we have referred to, some of it of a rather startling character. Mr. E. M. Nelson contends, for instance, that the various gelatines of their repertory are as definite and uniform in quality as any other commercial acticle, and, indeed, much more so than by far th larger number of such articles; and that the variation found is due to the variability in the mode of preparing it for use, gelatine in solution being affected by the degree of temperature to which it is submitted, and by the duration of the operation. He gave us sound reasons for these assertions, showing that by the large scale of their operations, the careful testing and assorting of each batch of gelatine, and the large stock with which the assorted articles are subsequently mixed, uniformity of character for each sort issued for sale is a necessary result. But to this subject, and to the best methods of preparing gelatine for photographic purposes, we propose to revert in another article, confining ourselves at present to our notes of the Emscote manufactory.

Emscote is a little hamlet on the Birmingham and London Canal, lying between Warwick and Leamington, and to the latter place we lately repaired by the North Western Railway. The son of one of the principal members of the firm very politely met us at the station and drove us to the factory. We left the charming town of Leamington behind us, passed through a line of neat surburban villas towards the picturesque old town of Warwick, and, when just in sight of the handsome spire of one of its churches, we diverged to the right, passed a neat lodge through a pretty avenue of Scotch firs and limes planted alternately, and found ourselves not before the expected factory, but in face of a mansion surrounded by an almost park-like expanse of ground dotted with fine conifers and framed by a border of luxurious vegetation. Here we were most kindly received by Mr. G. H. Nelson, the resident partner, who himself conducted us over the most extensive and complete chemical factory we have ever seen. We were astounded at the extent of ground occupied by the numerous buildings, an area of five acres being fully filled therewith. All trace of age and gradual growth has been swept away, and everything seems bright and new, and fitted up in the most perfect and complete manner. Indeed, the offices, engineers' and partners' rooms, laboratory, and testing rooms may be called luxurious. Moreover, while ministering to their own comfort during business hours, the members of the firm have not forgotten their work people, about 250 in number, but have provided for their accommodation during meal-times and for their instruction or recreation as liberally as for themselves. A large hall one hundred feet long has been built specially, and fitted appropriately as a dining room, and an upper floor of the same dimensions as a reading room, ball room, and occasionally as an amateurs' theatre.

We found the statements of Mr. E. M. Nelson true to the letter. Ostensibly the manufacture consists simply:—1. In carefully preparing and purifying the materials we have described to a degree of whiteness and purity such as to make ordinary calves' head dingy in appearance, the blanched pieces reminding us rather of cods' sounds delicately prepared by a cook and waiting for the sauce. 2. In drying and cutting up these pieces. 3. In soaking the pieces in lime water or some other special solution till soft and swollen, and then washing them in running water till no traces of caustic lime or other alkali are left, pure well water being used for the purpose 4. In dissolving the washed pieces in large vessels heated by a surrounding steam jacket to effect their solution, decanting that solution and evaporating it in other vessels of equally gigantic dimensions till of the right consistency to form a solid jelly, when the solution is carefully filtered. 5. Pouring the filtered solution upon carefully-levelled stone or glass-covered benches placed in cool, well-ventilated and shaded rooms sixty or seventy feet long, and about half as wide. When the jelly has cooled and solidified, it is cut into strips and placed on nets framed in wood so as to be easily handled and transported from the cooling rooms to those arranged for the drying. 6. Here the jelly shrinks and dries, and when the desiccation is complete, that known as "sheet gelatine" is ready for the market after being carefully tested and classified. 7. By far the greater portion of the manufacture is, however, not sold in this state, but is cut up into thin strips, and it is this form of the article which is so popular, and which is packed in the yellow and red parcels respectively to which we have already referred.

This outline completely embraces the process of making gelatine at Emscote; but it would require the space of more than one whole number of this journal to describe, even in general terms, the various mechanical appliances by which it is carried out in every one of the seven steps we have described. Some idea of the extent of these and of Messrs. Nelson, Dale, and Co's. operations in general, may be formed when we state that we counted no less than seventeen steam engines, without including the large central engine which supplies the little river of water required for the use of the factory;

and that on taking the trouble to carefully measure the area of the glass or slate on the cooling benches, we found them to be more than six hundred square yards, or more than one eighth of an acre.

We have omitted to mention that, in addition to the factory proper, the establishment comprises a brass foundry, and very complete smith and engineers' shops fitted with lathes, planing machines, and other automatic tools, so that the special machinery used at Emscote, and which has been very greatly improved by Mr. W. Nelson, the engineer and practical manager, is not only repaired, but constructed, on the premises.

Some idea of the history of gelatine making at Emscote may be formed by an inspection of the yard attached to the work-shops, in which will be found a museum of chemical vessels, and of various parts of discarded machines, rusty by exposure, yet many of them in perfect condition, showing the various phases through which the factory has passed during its thirty years' duration and experience; and the spirit of enterprise which has caused the rejection of complete sets of vessels, many of very considerable size, when a more economical form had been found, or when the progress of the demand had necessitated a larger scale of operations.

We cannot conclude our notice of Emscote without formally thanking all the principals for their very courteous and instructive reception, which gave us great pleasure.

We regret that within the bounds of our space we are able to convey but a very limited idea of the extent and completeness of this model factory, and of the taste, spirit, and largeness with which it has been conceived and is directed.

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."

No. 5.—The Bride—A Lesson for Retouchers.

"She thought 'twould have a pretty look,
If in her hand she held a book."

I made this negative last year. It is what I term a first-class one: clean, pure, and well lighted—the shadows falling softly from the highest lights on the forehead, nose and chin, to the deepest folds of the rich white dress. Yes, a dress of white satin, Brussels lace, and orange blossom, decorating a face and form; but she is a bride, gentlemen, and my innate gallantry makes me silent for the nonce!

Take a peep through the negative once more, my friend. What do you think of that for retouching? What? You think I have overdone it? There you are in mistake. Listen and learn.

It was a most lovely day in the end of April. I can remember the day perfectly well because it was my birthday, and I felt sad—very sad; not so much at the idea of getting old, but because every one seemed to forget the propitious day! No one shook me by the hand, no one sent me congratulations, no one sent me presents, my wife had forgotten all about it (I've seen the day that she didn't); and the governor was as matter-of-fact as usual. Now, was not that enough to make one sad on one's birthday? But worse remained behind. Sir Morgan ap Thomas ap Jones, a Welsh gentleman with a diminutive purse, and a pedigree that would beat the Laird of Cockpen's for length, was about to lead to the hymeneal altar the only daughter of the late Gubbins, Esq. Those who are curious about it can to this day behold the name Gubbins in connection with a thriving pawnshop in Bishopsgate Street Without; but still, when Gubbins died, he left his only child a fortune of over three hundred thousand pounds. That Sir Morgan the penniless should wed Miss Gubbins the rich was natural, and, as this world goes, a well-assorted match; but that Sir Morgan should choose that bright day in April of all others to bring his bride elect to be photographed, I hold to be most unnatural, and I have no hesitation in asserting it to be one of those numerous tricks that Dame Fortune delights to administer every now and then to your unfortunate contributor.

Towards noon, Sir Morgan and his ladylove made their appearance, and while the lady's maid was officiating upon her mistress in one of the dressing-rooms, Sir Morgan fixed me up in a corner of the show-room—and gave me his instructions.

"Look here, you know," he exclaimed. "As far as I can learn, she has never been photographed before, and I beg of you to do your very best. I don't want anything pompous or stuck up—something—you know—you know! something nice—ladylike and easy! I may tell you that the lady has not got very decided or regular features, so you must do the best you can to catch the expression, you know!"

Now, Sir Morgan was a man of immense physique, and stood over six feet in height; fancy my feelings, then, when the bride (measuring about a yard and six inches) at this moment entered the room. I have been nearly twenty years at the business now, and pride myself somewhat upon my Indian-like stolidity of countenance under any circumstances, but I know that my brethren will excuse me if I *did* twitch my mouth a little upon that occasion.

By-the-bye, as long as I am on the subject, I should advise every photographer, who may have assistants under him, to pay great attention to the above hint. A great number of our sitters are very sensitive, more so than our plates sometimes, and they are extremely quick at picking up anything like being *made game of*, to use a vulgar but expressive phrase. Whenever I see any tendency to levity in my assistant, I instantly wave him into the dark room—there I knock his head a bit, and if that has not the desired effect I order him off to the cellars to wash off old plates: a few hours of this work generally sobers him.

But the bride waits! I bestowed upon her one of my best bows, murmured something about the beautiful weather she had brought with her, and kindly invited her, if ready, to step up to the glass house. Then you should have seen those two! She clung upon him in the most affectionate manner—she lifted up her doll-like eyes to him, and brimmed over with love and idolatry. And he stooped over her, his smart beard brushing her golden locks, and almost carrying her up stairs! An idea at the time struck me that I had at some period or other seen two such figures, but for the life of me I could not at the moment call to mind.

And now I had her within the boundary of my own realm, and my troubled eyes ran furtively over the accessories. Heavens! Had I a piece of furniture small enough to pose her? Do not laugh; it is a fact! She was the smallest specimen of womanhood ever I photographed—a mere doll—a puppet—a marionette, with the shrivelled face of a monkey! Oh! ye gods, where is my innate gallantry?

"Now be sure you make her look cheerful!" was the last injunction of her gigantic cavalier, as he disappeared behind the curtain that hides a small gallery of pictures where I always put the friends of my sitters.

"There is no fear of that!" cried my little bride, with a shrill chuckle and in a piping treble voice. "If I look like myself, I must be cheerful; for I'm such a *merry* little thing!" And she rejoiced after the manner of Punch when he slays his wife.

And now the serious business commenced. First one chair—then another; now standing up, and anon sitting down. I never had such a job in my life, as I had in trying to get a graceful pose of that little—*merry* little thing. At last I had managed to get something like ease infused into her. It was hard work, I can tell you, and as I moved her about I could hear distinctly every joint in her little dried-up body crack, or I should rather say creak.

Just then, I say, as I was all ready and about to expose, the hirsute head-piece of Sir Morgan appeared in the opening of the red damask curtain, and his deep-toned voice exclaimed, "If you don't make a pleasant picture of her, I won't have it, don't you know!"

I waved a wrathful hand at him, and he disappeared; but the evil was done. When I looked at my marionette, she was like a corkscrew. All my work had to be done over again.

"Isn't he a darling?" she chirped, as I re-arranged her. "Oh, I do love him!"

A flash of memory, illuminated by her doll-like eyes, revealed where I had seen such another pair. It was a strolling company, and they played "Ingomar, the Barbarian." Yes, there was Ingomar, with his trumpet-like voice and his six feet of silk tights, his hirsute phisog., his brute-like affection; and here was Parthenia, with her love and devotion, and her interesting squeak! The only difference was that Parthenia was the daughter of an impecunious armourer, and Miss Gubbins—you know what she was.

And now I photograph Parthenia. She is perfectly still, but her light blue eyes are misty—perhaps she is thinking fondly of Ingomar behind the curtain—and every wrinkle in her shrivelled face comes out with startling distinctness. However, *that* can be remedied in retouching.

The ordeal is past, the sitting is over; and, more sad than ever, I am slinking away to my luncheon, when I am pounced upon by Ingomar.

"When shall I have the proofs?" he shouts. "And look here, don't you know, I expect them finished in the best style, for if they are not," etc., etc.

I did not require all those injunctions to induce me to try and retouch the negatives in the best manner possible. There was not much business doing at the time, and being assured that they had plenty of money and would give a large order if they liked them, I threw forth my powers and retouched them in my grandest style.

The proofs were sent home—and allow me here to say that they flattered the little bride in the most liberal manner—and two days after Ingomar strode into our reception room.

He is very solemn, and opens out the packet of proofs with the slow motion of a lawyer breaking the seal of a will. At length he speaks.

"Miss Gubbins approves very much of the photographs, and she would like a couple of dozen of each, only that *she would like her pictures retouched!*"

Now, brother retouchers, what do you think of that? Comment is useless. I will leave you to your own surmises, only adding that art is very nice—but peace of mind and a good dinner are nicer.

Correspondence.

HOURS OF ASSISTANTS.

DEAR SIR,—I observe a letter relating to the above. I do not object to the hours of the "photographer who knows something of the business." Indeed, I consider them very reasonable so far; but when is dinner to come in? From eight to six is a long spell to be always on the move, without any rest or refreshment. I do not mean to imply that a "photographer who knows something of the business," does not make arrangements for his employés receiving time to fortify the inward man and renew their strength, but I have met with so many who forget that their assistants are made of flesh and blood, that I cannot help trying to bring the subject before their notice.

A horse will not work long if he is not fed. A field labourer has his hour for his bread and cheese, and his mug of cider; but what about the photographic assistant? He must live from morning unto night in the poisonous and obnoxious air of the dark room; he must bear the stifling heat of the glass room; he has to smile to customers when his stomach is empty, and, perhaps, when his heart is heavy. I do not speak without experience. I have worked in the principal street of a certain city, and taken as many as forty different cabinets on one winter's day, and when I intimated the advisability of getting some sustenance (then about five o'clock), I was calmly asked if I had varnished the negatives? Would not a little bit of cold meat and mustard have been more comforting?

I know there are exigencies in a photographer's life, but, as an old friend of mine used often to remark, "There is a midst in the sea"; and photographic employers should remember, that the better the horse is fed, the harder he will work.—I am, yours truly, BEAU NASH.

ON THE NEW DEVELOPER.

SIR,—I have made at times various experiments with the idea of obtaining development in the camera, but without any satisfactory results. Kinone appears to give promise, from Captain Abney's remarks, of obtaining this end.

When this point is arrived at, all trouble will cease as to exposure, as, by having a small glazed aperture of deep ruby glass in the side of the camera, and sheltered by a large focussing cloth, the operator can watch the development of the picture on a plate of moderate rapidity, and know the exact moment to recap the lens.

En passant, perhaps, some one will inform us a little more about the origin and properties of kinone, where to be obtained, and price. It may lead to the discovery of other valuable drugs suitable for developing.—I am, yours obediently, J. W.

Proceedings of Societies.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE annual meeting of the Council of this Association, was held July 14th, the Right Hon. the Earl of ROSSE in the chair.

The minutes of the last meeting having been read and confirmed, the following members were elected:—Mr. Horatio Fenner, Capt. F. F. Parkinson, Messrs. Simeon Norman, H. G. Close, G. De la Hoyde, Herbert G. Moberley, and H. B. Blacklock.

The SECRETARY read a letter from Mr. Gooch, regretting his inability to be present at the meeting.

Mr. GLAISHER then laid before the members his annual report, and called attention to the general use of gelatine plates, and the improvement in the quality of the pictures resulting therefrom. He noticed particularly some very remarkable instantaneous pictures by Mr. Brownrigg, in one of which the Portsmouth express was photographed whilst passing at full speed. Mr. Vanner's instantaneous sea pictures were greatly admired, and considered equal to anything ever contributed to the Society.

The following is an abstract of Mr Glaisher's report:—

Class I. consists of 90 pictures contributed as follows:—R. O. Milne, 11; W. S. Hobson, 10; W. Vanner, 9; R. Leventhorpe, 5; J. W. Leigh, junr., 5; R. Murray, 5; T. Brownrigg, 5; F. Schwabe, 5; W. Stewart, 4; S. Norman, 4; A. Suzanne, 3; F. Beasley, 3; J. C. Hannyngton, 3; R. de Putron, 3; H. G. Close, 3; Capt. McNeill, 2; G. Cresswell, 2; G. Brook, 2; A. Watkins, 1; W. E. Gibb, 1; A. C. Swinton, 2; The Earl of Rosse, 1.

Class II. consists of 104 pictures as follows:—W. S. Hobson, 11; R. Leventhorpe, 9; H. G. Close, 10; J. C. Hannyngton, 7; F. Beasley, 6; W. W. Unett, 5; J. L. Ranking, 5; The Earl of Rosse, 5; F. Schwabe, 4; W. Vanner, 4; R. Murray, 4; A. Suzanne, 3; Capt. McNeil, 3; Rev. W. E. Hancock, 3; G. Cresswell, 3; W. Stewart, 3; Lord de Ros, 1; T. Brownrigg, 1; A. R. Hunt, 2; G. W. Green, 1; Mrs. Welbourne, 1; R. O. Milne, 1; W. Muller, 2; A. Watkins, 1; J. W. Leigh, 1; G. Riddiford, 1; E. Dubois, 1; G. Brook, 1; R. de Putron, 2; A. Swinton, 2; S. Norman, 1.

Class III. consists of 144 pictures as follows:—C. Stephens, 5; Lord de Ros, 3; A. Suzanne, 2; F. Beasley, 10; R. Murray, 1; F. Brownrigg, 1; W. S. Hobson, 3; F. Schwabe, 1; A. R. Hunt, 3; W. S. Green, 3; Mrs. Welbourne, 4; P. Gunyon, 1; R. O. Milne, 4; W. W. Unett, 13; W. Vanner, 5; Miss Coxe, 2; W. Muller, 1; Capt. McNeil, 2; R. Leventhorpe, 3; A. Watkins, 7; Rev. W. E. Hancock, 8; G. Riddiford, 2; W. E. Gibb, 3; E. Dubois, 5; G. Cresswell, 3; J. Hannyngton, 1; J. L. Ranking, 8; G. Brook, 3; R. de Putron, 1; W. Stewart, 5; A. Swinton, 2; H. G. Close, 12; S. Norman, 4; The Earl of Rosse, 10.

The remainder of the prizes are comprised in Classes IV., V., and VI.

The following prizes were then awarded:—First prize, a large silver cup in case, W. Vanner, for pictures 39, 40-43, and 44; W. S. Hobson, a silver cup for pictures 191, 198, and 214; F. Schwabe, a ditto, for pictures 6 and 9; R. O. Milne, a water-colour drawing in frame, for pictures 138, 141, and 151; R. Leventhorpe, a ditto, ditto, for pictures 22 and 29; F. W. Leigh, Jun., an album handsomely bound in morocco, for pictures 29 and 30; R. Murray, a painting in frame, for pictures 144-150, and 155; A. Suzanne, a ditto, ditto, for picture 7; S. Norman, an album handsomely bound in morroco, for pictures 2 and 6; Captain McNeill, a ditto, ditto, for pictures 1 and 10.

Certificates of Honourable Mention were awarded to Messrs. F. Beasley, T. Brownrigg, A. Watkins, G. Cresswell, J. C. Hannyngton, J. L. Ranking, G. Brooke, R. de Putron, W. Stewart, A. C. Swinton, and H. G. Close.

A vote of thanks to the Chairman was proposed by Mr. Glaisher, seconded by Capt. Lewis, and passed unanimously.

A. J. Melhuish, *Hon. Sec.*

Talk in the Studio.

A Self-closing Plate-box.—Mr. Edwin Sutton, of Sydney Street, South Kensington, sends us a plate-box that closes with a spring, and is, therefore, well adapted for sensitive plates; films cannot spoil by neglecting to close the lid.

A Photographic Action.—*Photography and Art.*—Kilpin *v.* Jungmans.—In this action the plaintiff, an artist and art photographer, of Gloucester Road, Regent's Park, sued the defendant, Adolphe Jungmans, an artist, of Fitzroy Square, to recover the sum of £5 7s. 6d., being the amount alleged to be due on a balance on account for work and labour done. The plaintiff stated that he was employed to touch up a large photograph, an apotheosis, which, when engraved, the plaintiff was to present to her Majesty. He agreed to retouch the upper part for £4, and the same sum for the lower part of the picture. He had received £4, but there was some extra work which amounted to the sum now sued for. Mr. Marcus Herbert Lewis, who appeared as solicitor for the defendant, contended that the plaintiff had been amply repaid for his services in spoiling his client's photograph by scraping it, and when retouched he made the angel part of the group to "squint," and he had so altered the lights that it was perfectly useless in the hands of the engravers, and the picture had now to be re-photographed, in order that it might be engraved from. The defendant, called, said that the colours required in retouching could not stick in consequence of the plaintiff scraping the surface away. There was no contract at all. He was to receive £4, which had been paid him, although he had caused him (the plaintiff) considerable annoyance. Mrs. Walker, the defendant's housekeeper, was called, who proved the damage done to the picture, the payment of £4, and was present when the plaintiff was engaged by the defendant. Upon which the learned judge considered there was no contract between the parties, and considered under the circumstances the plaintiff had been amply paid. Judgment was accordingly entered for the defendant, with costs.

A Bookseller's Portrait Gallery.—A correspondent writes:—Mr. Heinrich Hermann, bookseller at Leipzig, is a most industrious collector of portraits of notable persons belonging to the trade. His collection contains about 600 portraits executed in all styles except photography, which is excluded. As some English colleagues may be interested in the same way, perhaps they may be glad to exchange notes with Mr. Hermann.—*Bookseller.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

A Beginner.—All lenses have a tendency to depress rising ground in front. A formidable mountain is sometimes dwarfed to insignificance in a photograph. At the same time, if your camera has a movable front, you can remedy the defect in a great measure by sliding the lens up towards the top of the plate. Try this next time, and see that the rays of light strike the object as nearly as possible at an angle of 45°, and you will get a far more satisfactory result.

L. L.—The *Moniteur de la Photographie.*

H. Jordan.—You have the lights too brilliant and the shadows too deep. Place a screen beside your camera, so that the light from the window does not come into the vicinity of the lens, and put another screen with a white reflecting surface beside your model, so that it reflects back the light from the windows. You have plenty of light and to spare, but it wants to be more diffused.

S. W. O.—Thank you for the specimen, which quite carries out your statement. We should think there is enough novelty in the picture to secure it attention; but of this you are able to judge probably better than ourselves. We do not think sponge has ever been tried.

W. H. P.—1. We have had only one complaint this year about the Customs, and in this case the plates were not stopped on an explanation being given. Make them up in parcels of six or twelve, not bigger, and you will experience no difficulty. We have travelled with dry plates in Norway, Denmark, Sweden, France, Germany, Switzerland, Italy, and Austria, and only once at Copenhagen were we challenged; they were never stopped. Sea-air, remember, is very injurious to the gelatine film; we pack in caddy tin (thick tinfoil) which is as good as a tin-lined case. 2. and 3. Yes, if you fix on return will do, but you must wash well and keep in the dark; but if you are going to develop, surely fixing at the same time will not entail much more work. 4. It is the weather; we presume you employ chrome alum, which should prevent stickiness in a great degree. Do not dry in too warm a temperature, but with plenty of air. We cannot use sheet gelatine yet.

F. Garland.—There are no doubt better instruments to be had, but they are by no means to be despised.

Dereham.—Three negatives with this postmark reach us, but without any note. They are all over-exposed, and two of them fogged undoubtedly for this reason. Give less exposure, or restrain the development by addition of bromide solution. A gelatine negative, when placed upon white paper, should be quite transparent in the deep shadows, and free from brownness. To see if your plates are absolutely free from fog to begin with, develop, and fix one of them without exposing.

Venator.—In many cases we can distinctly trace dark particles in the centre of your spots, and there is a circling round these particles which leads us to think that imperfect protection of the plates when drying is the cause of your defects. The circumstance that you have changed your gelatine gives further weight to this idea. Grease in gelatine will give dull spots something like those on your plates, but there is ample proof in our mind that they are due to dust particles alone. The pale primrose of your film is very satisfactory, and in other respects your emulsion looks promising; and we feel sure that by improving your drying arrangements the spots will disappear.

S. P. Q. R.—Your experience is not altogether unique, as we have noticed a similar effect when the iron solution has been over strong, or the proportion of acid insufficient. Gelatine holds irons compounds with considerable tenacity, and if the plate charged with an iron salt were placed in ordinary hard water, which contains calcium carbonate, an opaque deposite of iron carbonate would be deposited in the film. To sum up, reduce the proportion of iron, increase the acid, and slightly acidify the first wash waters (see our leading article in the News for June 25th).

Tup.—It should only be slightly acid. You may add a drop or two of nitric acid, but do not overdo it.

A. Page.—We think you must refer to some prize editor; it is rather out of our province.

J. C. Smith.—Try this for mounting; you need not fear cockling, at any rate. First dissolve 16 ounces of French glue in 30 ounces of water. Second, dissolve 6 ounces of dextrine in 8 ounces of methylated spirit and 4 ounces of water, by placing it in a beaker, which must be put into hot water and stirred with a glass rod until of a clear brown colour; add this to No. 1, stirring all well together. This will set on cooling, but may be liquefied in a few minutes by heat.

W. B.—Certainly, you can do no harm in trying it.

The Photographic News, July 30, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Dr. Tanner—The Lighting of the Dark Room—Photographs at Exhibitions.

Dr. Tanner.—Has this eccentric and now notorious individual been regularly photographed during his self-imposed penance? And, to use the language of a well-known advertisement, "if not, why not?" There is great room for diversity of opinion as to the wisdom or folly of the Doctor's experiment; but, under the circumstances, there can be no doubt as to the desirability of securing some kind of permanent record as to the effect of starvation on the human frame. Supposing that each day a series of photographs had been taken, which should include a distinct view of every part of the Doctor's body, anatomists in every part of the world would be enabled to trace out the consumption of each fatty deposit, and the wasting away of the various muscles under the influence of abstinence. Such a series of pictures would not only possess a very great anatomical value, but would possess considerable physiological interest in very many ways. For such a series to possess its full scientific value, it would be necessary for the photographs to be taken under the direction of a skilled anatomist, aided, perhaps, by an experienced physiologist, as it would be necessary to pose the Doctor in such a manner as to obtain indications of the state of those muscles and fatty deposits which have comparatively little influence on the external form. It is scarcely necessary to remark that it would be requisite to adopt the same poses and similar modes of lighting on each successive day; and it is probable that a series of ten or twelve photographs reproduced from day to day would prove capable of affording most of the information likely to prove of value to the anatomist, the physiologist, or the student of biology. It may be premised that isolated photographs representing the effects of starvation would be of comparatively little interest, but the series suggested would have a very great value indeed. A series of the kind referred to would, perhaps, be of utility to the artistic profession, but no doubt its importance in this respect would be quite secondary to its biological interest. Although it may be that the opportunity of securing such a valuable record of Dr. Tanner's fast has been lost, it is still possible to secure a collateral series representing the recovery of the human frame from the effects of abstinence. Both series read together by skilled interpreters could scarcely fail to throw much light on many points which are but imperfectly understood at the present time. Photography has already rendered a considerable amount of service to the various branches of science more or less affiliated to the practice of medicine and surgery. The anatomist, the histologist, the physiologist, the osteologist, and the biologist, all make occasional use of photography as a means of assisting them in their studies; but it is, perhaps, in pathological science that photography is likely to prove of the greatest value. No systematic means appears to be taken for obtaining photographic records of the numerous cases of interest which occur in hospital practice. If in each London hospital a "photographic clerkship" were allotted to one of the senior students who might feel disposed to qualify himself for such an office, most interesting records might be obtained. Suitable dry-plate apparatus being kept in constant readiness, the patients concerned would be subjected to little or no inconvenience; and the result, printed by the collotypic or Woodburytype method, would add greatly to the value of the hospital reports.

The Lighting of the Dark Room.—How diverse are the views of various photographers regarding this matter! Some work in depths of darkness watched over and guarded by several thicknesses of ruby glass, to say nothing of one or two sheets of orange or yellow just thrown in as a make-weight; while others boast that they can develop successfully in an apartment abundantly illuminated with yellow light. No doubt it is quite possible to work under these latter conditions—in fact, we have done it ourselves—but it is necessary to always shade the plate from the direct light of the window, and so far to guard one's movements as to take away nearly all the comfort of possessing a well-lighted developing room. With a tolerably safe light one can work much more freely and comfortably; and it is surprising how much one can see, even in the most dimly-lighted dark room, after the pupils have become thoroughly expanded. It is much to be desired that some definite information should be obtained as to the probable effect of the modern dark room on the eyesight, and more especially as to the effect of frequently passing from a bright light into a dim red light, and *vice versa.*

Photographs at Exhibitions.—The authorities at the Sydney Exhibition appear to have given considerable dissatisfaction as regards the display of very many of the smaller articles, but photographers seem to have had especial reason for complaint. Many photographs sent for exhibition are said not to have been displayed at all, while others were so badly and inconveniently placed as to be practically inaccessible to the visitors. At the Düsseldorf Exhibition, on the contrary, the officials have duly recognized the industrial and artistic importance of photography. The collection of photographic work brought together in the artistic little town of Düsseldorf is, according to all accounts, one of unusual interest and merit, although confined to work executed in Germany. Artistic groups, burnt-in enamels, enlargements in carbon or silver, collodio-chloride transparencies, photo-galvanography, collotypic printing, and photo-mechanical processes generally, are well represented, but we do not hear much of gelatino-bromide work. The process in question certainly appears to be more extensively and universally employed in this country than on the Continent, although there are abundance of Continental workers who are by no means behindhand as regards the excellence of results which they have obtained by the gelatine emulsion method.

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."

No. 6.—A Quiet Subject.

This is a negative from which I sent a print to a young friend of mine, and he was so struck with the delicacy of the shadows and roundness of the whole picture, that he expressed a wish to know how I had achieved such results within the limited space of a small bedroom, with only one window. Thinking perhaps that others of your readers would like to learn a wrinkle or take a hint upon the same point, I give you now my experience with a "quiet subject."

We had had a heavy fall of snow; it lay quite three inches deep. Disease was aiding and abetting old Death in his fell purpose. When one went to the club there was nothing talked of but small-pox; when one opened conversation in the studio, the typhoid mania, as a rule, ended the dialogue. There was no mistake—black Death was abroad and smiting old and young.

It was a miserable day! Black, cold, and grimy—your breath as you emptied your lungs appeared white as tobacco smoke—your clothes felt moist, and the apparatus felt sticky and clammy—indeed, it was proper day for a "quiet subject."

"I hope it is nothing contagious?" I anxiously inquired, as I listened to the pleadings of the lady's maid.

"Only diptheria!" was the answer, accompanied with a comforting assurance that once the breath was gone there was no chance of catching the infection—besides, they had Condy's fluid placed all over the house. "And missus says that you can make your own terms, so that you make a nice picture!"

Oh, mammon—mammon! The phrase about the terms fetched me. "Tell your missus that I will have the pleasure of attending to her orders in half an hour."

The next thing I did after the lady's maid's departure was to call my prieter—a big, stout fellow, with a nerve that nothing will shake. "I am going to take a corpse, Henry," I explain, "and I wish you to carry the tripod, and help me."

"All right, sir," was his cheerful answer. There was no mistake, he rather liked the job.

My next step was to sensitize two plates—half-plates for a repeating back camera—thus being able to take four pictures. I used a Dallmeyer lens with the No. 6 diaphragm. A piece of blotting-paper damped and placed over the backs of the glasses effectually kept away those distressful oyster-shell markings that so frequently occur when any length of time occurs between the sensitizing and the developing.

All was at length ready. I carried the camera and dark slides, and Henry had the most laborious job of shouldering the stand. However, fifteen minutes' walk brought us to the place.

There was wealth around. We could see that at a glance, in spite of the cold and the snow. There was the large gate, the solemn porter, and the fat, fierce dog that snapped so very, very near to poor Henry's calves, that in terror he dropped the heavy camera-stand upon its back. We heard that dog occasionally during our stay in the mansion, but we did not see it any more.

And now we are in the little bedroom.

There is a close oppressive feeling—your eyes wander to the iron bedstead, and they are rivetted upon a dim outline visible underneath the snowy sheet. The sight raises a feeling of times gone by, and while the hoarse whisper of the pale nurse hisses in your ear, other days and other forms rise before your mind's eye, and you heave a sigh as you turn to unpack your camera and slides.

"Will you be able to do it where the bed is?" asks the nurse.

"No; it is impossible! I must have the head of the bed placed close against the window—a little more to one side than the other."

This Henry and I have to do. We shift the furniture, and gently lifting the bed we place it as I want. I get a cushion and lift the head as high as I dare, still not high enough for my purpose, for the nostrils will show in the most absurd manner.

Now the focus and everything is ready for the exposure. If I exposed by means of the light that we had upon the face of the corpse, it would have required ten minutes, and then not have been enough. Now how was I to lessen the exposure and make a good picture?

Every one who has read as far as this knows that I had nothing to do with the dry plates that do such wonders now-a-days. This paper has nothing to do with them, and I dare not express an opinion upon them. What I have to do with is my "quiet subject," which I managed by means of my wet process, with the Autotype collodion and a 35-grain bath.

Now the little wrinkle, gentlemen! It is not a great one, it is not a difficult one; and all I have to say in its praise is, for the photographer who has not tried it, to begin at once.

My exposure for the corpse was five minutes by my watch; but during each exposure the printer, Henry, drew off the cap, while I held a bedroom mirror in such a position—within a yard of the face—that I caught the rays of the weak December light and the bright snow, and imparted it to my "quiet subject."

For those who are able to take a hint, I need say no more. Enclosed are a couple of the prints. I developed them by an ordinary developer—they wanted no intensifying; and, in fact, I have said all I can say, and you can give your opinion of the prints, Mr. Editor, if you choose.

[We shall give no opinion; we have seen a good deal of Mr. Bradforde's work, and it has never failed to please us. —ED. P. N.]

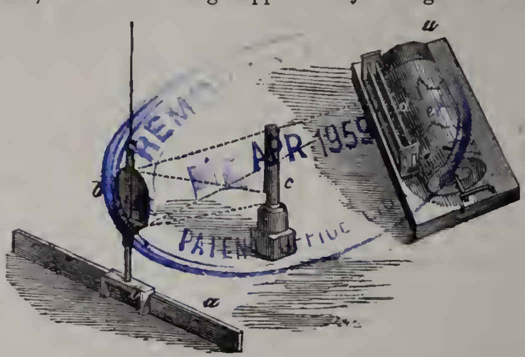
At Home.

AT THE ROYAL OBSERVATORY, GREENWICH.

THE Royal Observatory, Greenwich, is situated nearly in the centre of Greenwich Park, and was built in the year 1676 by order of Charles II. It was devoted almost exclusively to astronomical observations till 1840. In that year regular magnetical and meteorological observations were begun, and, for seven years, observations were made every two hours night and day. On some days, indeed, observations were made every five minutes for twenty-four hours consecutively, and on days of magnetic disturbances the observations were made continuously, so long as the disturbance lasted. The movements of the magnets are of so delicate a nature that nothing in the shape of a pencil could be attached to them to trace their movements, and no means, except the use of an imponderable agent like light, could be used for that purpose.

About this time two gentlemen—viz., the late Sir Francis Ronalds, F.R.S., and the late C. Brooke, Esq., F.R.S.—made experiments to register these delicate movements by means of photography, and from the year 1848 all magnetical and some meteorological observations have been recorded by means of the system perfected by Mr. Brooke.

His principle is shown in the annexed cut, in which *a* represents a part of a bar magnet; *b* a concave mirror, resting on a stirrup firmly attached to the suspension apparatus, the whole being supported by a single thread; *c*



an ebonite cylinder wrapped round with photographic paper; *d* a plano-convex lens; *e* a lamp placed a little out of the line which joins the centres of the cylinder and magnet in operation. A pencil of light passes from *c* through a very narrow aperture, diverges and spreads over the mirror *b*, from which it is reflected, and diverges to the lens *d*, and is condensed into a well-defined spot of light at the surface of the paper. The action of this spot upon the photographic paper is to leave a trace, which is, however, imperceptible until subsequently revealed by the application of a developing solution.

The principle adopted for all instruments is the same. For the register of each indication, a cylinder is provided whose material is ebonite, and which is accurately turned in a lathe. The axis of the cylinder is placed parallel to the direction of the change of indication which is to be registered. If there are two indications whose movements are in the same direction, both may be registered on the same cylinder; one on the one side, and the other on the other, keeping their traces separate, as shown by the two zig-zag lines, one at either end of the cylinder, in the preceding wood-cut.

Magnetic Elements.

The magnets in use at the Observatory are of hard steel, 2 feet in length, $1\frac{1}{2}$ inch in breadth, and $\frac{1}{4}$ of an inch in thickness.

If a magnet be suspended by its middle point, it would settle in the magnetic meridian, now about $18\frac{1}{2}°$ west of

the true meridian (which angle is technically called declination, or, popularly, variation of the compass), and inclined at an angle with the horizon of about 67½° (technically called the dip), and would be subject to diurnal changes, both right and left and up and down, as well as permanent changes of position from year to year. The value of the declination in the year 1840 was about 23½°, and that of the dip was 69°.

In practice, the declination magnet is suspended so as to be horizontal, and the changes right and left will be the same as in the inclined position; and the investigation of the diurnal changes of the dip are found by the use of two magnets, one called the horizontal force magnet, and the other the vertical force magnet. By combining the results found by the use of these magnets the variations of the dip are known.

A horizontal revolving cylinder will register the continuous records of both declination and of horizontal force.

The continuous record of vertical force necessitates the use of a vertical revolving cylinder.

Atmospheric Pressure.

The continuous record of atmospheric pressure is obtained by means of a syphon barometer; on the mercury, in the lower leg, is placed a glass float, partly immersed in the mercury; to the float is attached a vertical rod, supported by a horizontal bar which carries a vertical plate of mica having a small horizontal slit; through this slit the light of a lamp falls on a cylindrical lens, and from thence to the photographic paper.

The scale of the barometer is about four inches on the paper to a change of one-inch in the reading of the barometer, and these changes, being vertical, can be registered on the same cylinder as that devoted to the vertical force.

Spontaneous Earth Currents.

It is well known that spontaneous galvanic currents are almost always passing in the earth, and are at times very powerful, and frequently troublesome in telegraph offices. These earth currents are registered at Greenwich by means of photography. There are two wires crossing each other near the Observatory; these wires, from an earth connection at the Royal Observatory, extend in two directions nearly at right angles to each other to considerable distances from the Observatory, where they again make earth connection. Two magnetic needles, one for each wire, each suspended by a hair, so as to vibrate horizontally within a galvanometer, are placed respectively in the courses of the two wires. A current of one kind, in either wire, causes the corresponding needle to turn itself in one direction; a current of the opposite kind, in the other direction.

To the carrier of each magnet is fixed a small plane mirror, which receives all the motions of the magnet. The light of a gas lamp passes through a small aperture, and shines upon the mirror. A spot of light is thus formed upon the photographic paper wrapped upon the cylinder.

Dry and Wet Bulb Thermometers for Temperature of the Air and Evaporation.

These of necessity must be out of doors, and their bulbs open to all changes of temperature and humidity. The bulb of the thermometer employed as wet bulb is kept moist by the capillary passage of water along cotton lamp wicks leading from a vessel of water. The bulbs are eight inches in length, and their centres about four feet above the ground.

A vertical revolving cylinder and the carrying time-piece are mounted on a stand measuring thirty inches by twelve, supported by four legs; the stems of the dry and wet bulb thermometers pass up through the table and between the lenses and the adjacent surfaces of the cylinder; the long cylindrical bulbs are sufficiently below the stand to be freely influenced by the currents of air, and, at the same time, to remain wholly unaffected by the heat of the lamps, which are placed on wooden supports at each end of the stand, at such a height that the flame may be opposite the middle of the photographic paper on the cylinder.

As it is impossible to superpose two registers of these instruments on the same paper, which may be done without inconvenience when the indication consists of a dark line only, as in the photographs of the barometer and the magnetometers, the time-piece is so constructed that the hour hand makes half a revolution in twenty-five hours. By this arrangement the two halves of the paper surrounding the cylinder give respectively a perfect record of the two instruments. The glass cylinder is covered by a concentric cylindrical zinc case, having slits on opposite sides corresponding to the stems of the instruments, which are capable of being closed by sliding doors; by these means the cylinder, protected by its case, may be carried to or from the room in which the photographic manipulations are conducted without any risk of exposure to light. The whole apparatus is also covered by a wind and water-tight zinc case which rests on the stand, and is divided into separate compartments for the lamps by a partition towards each end for the purpose of more completely isolating the thermometers from the heat produced by their combustion.

The cylindrical arrangement above described, so obviously desirable in enabling the two thermometric instruments to be registered by one apparatus and on one piece of paper, was at first open to a grave objection, which has, however, subsequently been entirely removed. This has been effected by placing fine wires opposite to each degree across the aperture in the scale frame, through which the light is transmitted to the stem of the instrument.

By these wires a minute portion of the exposed paper is protected from light, and thus the darkened portion of the register is traversed by a series of parallel lines corresponding with the scale of the thermometer. In order to remove any ambiguity in the reading of this scale, a coarser wire is placed at every ten degrees, and an additional coarse wire at the points 22°, 54°, 76°, and 98°; as one of these points may always be made to appear on the register, the relative position of the extra coarse wire will determine the points of the scale which it represents.

It is very evident that the apparatus must afford some ready method of marking the time-scale on the paper—that is, of identifying any given epoch of time with the indications of the register. This is effected by closing at any two known times the sliding doors of the cylindrical case for five minutes, and then re-opening them. Two undarkened lines will be observed on the paper, corresponding to the known time.

The scales of the thermometers in use have about 80° to one inch, from the registers of which the temperature may be easily read. Of this scale, a space of about 60° may be illuminated at one time, and in order that the temperature indicated may always be within the field, the thermometers are capable of being raised or lowered by a screw, so as to bring the mean temperature of the season nearly opposite the middle of the paper; thus there is no probability that the record of any unusual and extreme changes of temperature will be lost.

Uniform rotatory motion is given to the cylinders by the action of clock-work; for two of the cylinders, which revolve in twenty-four hours, and for the thermometer-cylinder, which revolves in fifty hours, the axis is placed opposite to the centre of the chronometer, and a fork at the end of the hour-hand takes hold of a winch fixed to the plate of the cylinder. For the horizontal cylinders the plane of the chronometer work is vertical, for the vertical cylinders it is horizontal. The cylinders employed for the declination and horizontal force registers, for the vertical force and barometer registers, and for the earth current registers, are 11½ inches high, and 14¼ inches in circumference; those for the thermometers are 10 inches high, and 19 inches in circumference.

Each cylinder is covered, when in use, by a tube of glass which is open at one end, and has at the other end a circular plate of ebonite or brass, perforated at its centre. The tube is a little larger than the cylinder. Its open end is kept in position by a narrow collar of ebonite, and the opposite end by a circular piece of brass fixed to the smaller brass plate at the end of the cylinder.

To prepare the cylinder for register of indications, it is covered with a sheet of sensitised paper (the moisture on the paper usually causes the overlapping ends to adhere with sufficient firmness); the glass tube is then slipped over it, and the cylinder thus loaded is placed (if horizontal) with its pivots in bearing upon its two sets of antifriction wheels; or, if vertical, with its end brass plate upon a rotating brass plate, and its central perforation upon the spindle of that plate. Care is taken to ensure connection with the clock-work, and the apparatus is ready for action.

The trace for each instrument is produced by a flame of coal gas usually charged with the vapour of naphtha. For the magnetometers the light shines through a small aperture about 0in. 3 long, and 0in. 01 broad; for the earth current apparatus and for the barometer the aperture is larger. The arrangements for throwing on the photographic paper of the revolving cylinder a spot of light which shall travel in the direction of the cylinder's axis with every motion of either magnetometer or galvanometer, or with the rise and fall of the mercury in the barometer, are as follows:—For each of the three magnetometers a large concave mirror of speculum metal is carried by a part of the magnet-carrier; although it has a small movement of adjustment relative to the magnet carrier, yet in practice it is very firmly clampled to it, so that the mirror receives all the angular movements of the magnet. The lamp above mentioned is placed slightly out of the direction of the straight line drawn from the centre of the concave mirror to the centre of the cylinder which carries the photographic paper. By the concave mirror the light diverging from the aperture is made to converge to a system of plano-convex cylindrical lenses of glass, with their axes parallel to the axis of the cylinder, and the image is thus reduced to a bright spot of light.

Chemical Operation for the Photographic Records.

Sixteen grains of iodide of potassium are dissolved in one ounce of distilled water; twenty-four grains of bromide of potassium are dissolved in one ounce of distilled water. When the crystals are dissolved, the two solutions are mixed together, forming the iodizing solution. The mixture will keep through any length of time. Immediately before use it is filtered through filtering paper. A quantity of the paper sufficient for the consumption of several weeks is treated in the following manner, sheet after sheet:—The sheet of paper is pinned by its four corners to a horizontal board. Upon the paper a sufficient quantity (about fifty minims or 5-48ths of an ounce troy) of the iodizing solution is applied by pouring it upon the paper in front of a glass rod, which is then moved to and fro till the whole surface is uniformly wetted by the solution; or the solution may be evenly distributed by means of a camel's hair brush. The paper thus prepared is allowed to remain in a horizontal position for a few minutes, and is then hung up to dry in the air; when dry, it is placed in a drawer, and may be kept through any length of time.

A solution of nitrate of silver is prepared by dissolving 50 grains of crystallized nitrate of silver in one ounce of distilled water, to which 15 grains of acetic acid are added. Then the following operation is performed in a room illuminated by yellow light. The paper is pinned as before upon a board somewhat smaller than itself, and (by means of a glass rod as before) its surface is wetted with 50 minims of the nitrate of silver solution. It is allowed to remain a short time in a horizontal position, and if any part of the paper still shines from the presence of a part of the solution unabsorbed into its texture, the superfluous fluid is taken off by the application of blotting-paper.

The paper, still damp, is immediately placed upon the cylinder, and is covered by the exterior glass tube, and the cylinder is mounted upon the revolving apparatus to receive the spot of light formed by the mirror, which is carried by the magnet, or to receive the line of light passing through the thermometer tube.

When the paper is removed from the cylinder, it is placed, as before, upon a board, and a saturated solution of gallic acid, to which a few drops of aceto-nitrate of silver are occasionally added, is spread over the paper by means of a glass rod, and this action is continued until the trace is fully developed. The solutions are kept in the magnetic basement, and are always used at the temperature of that room. When the trace is well developed, the paper is placed in a vessel with water, and repeatedly washed with several changes of water, a brush being passed lightly over both sides of the paper, to remove any crystalline deposit.

The photograph is placed in a solution of hyposulphite of soda, made by dissolving four or five ounces of the hyposulphite in a pint of water; it is plunged completely in the liquid, and allowed to remain from one to two hours, until the yellow tint of the iodide of silver is removed. After this the sheet is washed repeatedly with water, allowed to remain immersed in water for twenty-four hours, and afterwards placed within folds of cotton cloths till nearly dry. Finally, it is placed between sheets of blotting-paper, and is pressed.

At all times the greatest care has been paid to cleanliness. White earthenware vessels were used from almost the beginning, and an abundance of water has always been freely used, and there is but little fading even in the earliest negatives. Photography has given continuous traces for many years of their different elements, needing only a few observations by the eye, taken during the hours of day, to convert them into true values of the different subjects of investigation, so that all-night work has now ceased for many years in this department of the Observatory, due entirely to this application of photography.

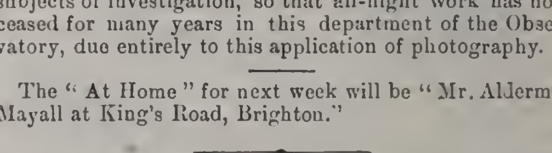
The "At Home" for next week will be "Mr. Alderman Mayall at King's Road, Brighton."

A SIMPLE SHUTTER FOR EXTRA RAPID PHOTOGRAPHY.

BY J. VINCENT ELSDEN.

Now that plates can be made possessing such a degree of sensitiveness, the principal difficulty in photographing objects in rapid motion appears to be in the arrangement for producing a really instantaneous exposure. Many contrivances have been employed for this purpose, but most of them are liable to objections, either on account of their great expense, or liability to fail at the critical moment.

Perhaps, therefore, it will be of use to give the following simple instructions, whereby, in a few minutes, by the aid of cardboard, scissors, and glue, a shutter can be made which will give an exposure in half the time required by a drop shutter. Without stating the duration of the shortest possible exposure by this means, I do not hesitate to say that it can easily be effected in less than $\frac{1}{2000}$ second. Take two oblong pieces of firm cardboard, and



B *Fig.* 1. A

cut out a circle in each, of the same size as the open lens, and situated so that the circumference of each circle passes through the centre of the cardboard, one to the

right of it, as in A, fig. 1, and the other to the left, as in B, fig. 1. The length of the pieces will vary with the size of the aperture required.

Now, take a third piece of card, of exactly the same length, but wider than the two others. Turn down the top and bottom to the same width as A, and fasten the outside of these turned-down portions firmly to another piece of the same length, to which a rim is affixed, which will fit on to the lens in place of a cap. Of course an aperture must be cut in the centre of these last pieces. Into the space between, we have now to slide the two first made pieces, one on the top of the other, so that the holes do *not* coincide; in which position no light should pass. Before putting the apparatus on the lens, draw out the cards, one on each side, until first the holes coincide, and then still more, until again no light passes. They will then have the position as in fig. 2.

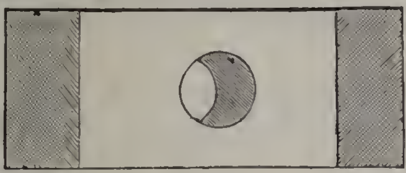


Fig. 2.

The act of exposure consists in squeezing with the finger and thumb the two edges of the cards into their original position, as far as they will go, as in fig. 3. During their

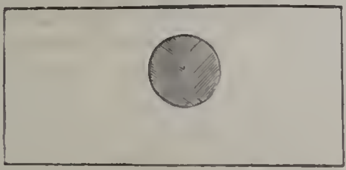


Fig. 3.

passage, which may be made as rapidly as necessary, the circles will slide over one another, giving the exposure and shutting off the light again, in one short motion, which can be made to vary at pleasure, by altering the size of the circles.

In this arrangement exposure begins at the centre of the lens, gradually spreading over the whole lens, and diminishing again towards the centre. Thus, however short the exposure, all parts of the picture get equally and simultaneously illuminated.

The simplicity and effectiveness of this cheap and easily made shutter will go far towards compensating for any little disadvantages which may result from its use.

SUBSTITUTION OF THE GLASS SUPPORT BY FLEXIBLE ONES, PAPER, CLOTH, ETC.

BY J. FERRON AND I. PAUL.*

For some years experiments have been made with the object of substituting for glass a flexible support that devoid of the defects of the former, possessed the advantages of presenting a more simple material for the purpose, as well for use in the gallery as in the field. These efforts, crowned with a happy result, will shortly be supreme in current practice, as soon as the process of gelatino-bromide is better known.

The preparation we use, better than any other, is fitted admirably for extension on continuous rolls of paper, reeled on cylinders, and arranged in a special plate-holder that will permit of many impressions in a small space, leaving therefore to history the dark tent and the changing box, which, until the present, have been indispensable for working outside the laboratory.

The prepared paper remains sensitive, though certain conditions are rendered very necessary. First, the paper must be completely inelastic, and impermeable to all the solutions in which it is immersed in its preparation and development. In the second place, it should offer a smooth surface, so that the film may proceed of uniform thickness in all its parts, in order that the image may be equally developed. On the other hand it is desirable that the material which renders the paper impermeable has no action on the gelatino-bromide. Another condition, not less needful, is to interpose between the paper and the prepared sensitizer a substance that should also be inert in contact with the latter, and insoluble in the developing solutions. Let us see how we have succeeded in securing these conditions without losing sight of simplicity and economy, indispensable requisites in a process meriting the name of practicability.

A paper of uniform texture previously dampened is pasted by its edges to a frame. When dry it remains strongly distended, and offers us a surface which is perfectly flat—a very necessary condition. To render it impermeable, it should be covered on both sides with a coating of the following varnish :

Anhydrous benzine	100 c.c.
Bitumen of Judea	2 grams.

Drain off the excess, and expose the paper to direct sunlight for an hour for the purpose of rendering the asphaltum insoluble, and then, without removing it, cover one of the sides with either of the following solutions :—

Sulph. ether	50 c.c.
Alcohol 42°	100 ,,
Wax, stearine or paraffin ...	1 to 2 grams
Alcohol 42°	100 c.c.
Sulph. ether	50 ,,
Bees-wax	2 grams
Vaseline	20 ,,

When the ether and alcohol are evaporated, and without removing the paper from the frame, cover it with emulsion, that should be dried in the drier, without driving off the water by means of alcohol.

In order that the film of emulsion should not be broken, and to render it easy to develop the paper in rolls, it is convenient to add a few drops of pure glycerine while in the act of dissolving it.

The paper prepared in this manner is cut in sheets of the dimensions we require, and fixed on cardboard, so that they are kept rigid; in this manner they may be collected in the form of a sort of album with each leaf having sensitized paper on both sides; in this way, a very considerable sensitive surface may be carried of insignificant bulk and weight, that would be embarrassing if glass were used for supports.

The images once developed and fixed, they are transformed into pellicle and covered with a solution of gelatine twelve per cent., and three cubic centimetres of glycerine. When the whole is dry, the flexible support separates easily, leaving a pellicular negative, differing in no respect from those stripped from glass. Before we conclude, we wish to make a frank expanation that may not prove useless to those for whom our treatise gives the first idea of the gelatino-bromide process.

The employment of gelatine as a vehicle of the sensitive substance is not new. Balard in 1851, Poitevin in 1871, and Maddox in 1874, laid the foundation of this process, which later in the hands of Franklin, Kennett, Stuart-Wortley, Chardon, Bennett, Fabre, Leisegang, Palmer, Stebbing, Chilton, Monckhoven, Boivin, and others, have advanced the grade of perfection so much desired. By their labours we have profited; their writings have served as guides on more than one occasion; notwithstanding, this little pamphlet is the product of our own observations. And here we again invite the attention of the public to the theory we advance on the subject of impressionability, invested in a completely original character, and, as we think, more in accordance with the facts than that presented by Sahler Mont-bèlard to the French Photographic Society.

* *La Instantaneidad en Fotografia* and *Anthony's Bulletin.*

The Photographic News.

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NEW EMULSIONS.

Complaints are just now rife as to the troublesome behaviour of gelatine emulsion. It easily decomposes in warm weather, sets with difficulty, dries very slowly, and not unfrequently becomes totally useless. In a word, satisfactory as gelatine films may be, all who work with them hope for something better, and from many sides comes the advice to render the gelatine soluble in alcohol and thus quicken the drying of the emulsion, or to return once more to collodion emulsion. Unfortunately, all endeavours to produce an alcoholic gelatine emulsion have been so far without any practical success, and, as everybody knows, we cannot impart to collodion emulsion any high degree of sensitiveness.

But Professor Vogel's new emulsion, from our short experience of it, appears to get over many of the defects which the summer weather has made so apparent. To all appearance, it is a happy and ingenious combination of gelatine and collodion emulsion, the solvent being, so far as a superficial examination can show, alcohol and acetic acid. The emulsion is at an ordinary temperature semi-fluid, and only becomes limpid when dipped into warm water. It is poured exactly like collodion upon a plate previously prepared with india-rubber solution or a thin coating of gelatine and chrome-alum. The superfluous emulsion is readily drained off like collodion, and the film in our hands set in a few minutes. Put away in a perpendicular position, the plate dried within an hour. There is no necessity, therefore, for any levelling apparatus, and as the emulsion pours after the manner of oil, it is easily manipulated. The sensitiveness of Dr. Vogel's emulsion we found to be about three-fifths that of a good commercial gelatine plate, so that in this respect the new compound may be considered satisfactory. We found both pyrogallic and ferrous oxalate development suitable. The picture appears slowly, but very rich in detail, and, unlike the ordinary run of gelatine plates, the result inclines to softness rather than hardness. The emulsion possesses the great advantage, we found, that it could be treated with a silver intensifier without showing any disposition to exhibit that detestable red fog.

In other respects, we may say that its colour is a deep yellow; the film is matt, and, like collodion, is injured by contact with water when in a moist state. A dry film, however, is no more damaged by moisture than a gelatine plate.

Another new emulsion is one which also comes to us from Germany, and which Dr. Wolfram has patented. To prepare his emulsion he dissolves two grammes of pyroxyline in 150 cubic cents. of a mixture of alcohol and ether; to one-half of this collodion he adds a solution of from 4 to 16 grammes of nitrate of silver dissolved in from 25 to 80 cub. cents. of concentrated ammonia which has been diluted with an equal volume of alcohol. Into the second half of collodion he puts an equivalent quantity of bromide of sodium or ammonium which has previously been dissolved in 10 or 20 cub. cents. of water. The bromide is mixed with the silver nitrate, and the resulting emulsion is precipitated with water. With the emulsion is mixed, when re-dissolved, two per cent. of glycerine, and eventually a sensitizer is also added. The principle of the method is good, for ammonia, as our readers may know, acts upon collodion emulsion in the same way as upon gelatine. The emulsion is thereby rendered more sensitive, although not to so exalted a degree as gelatine emulsion, if collodion alone is present. At the same time Dr. Wolfram seems to us to employ rather too much ammonia, and he must find it difficult to avoid fog; a sample prepared by the patentee himself certainly gave us fogged negatives.

Dr. Wolfram's method of preparing collodion emulsion with ammonia may nevertheless have its advantages if a good sensitizer is employed; in the meantime, however, we have to report very favourably upon Dr. Vogel's compound, of which our readers may expect to hear more shortly.

PHOTOGRAPHS OF MOTION.

Our Paris correspondent, M. Léon Vidal, recently described in these columns an instrument termed a praxinoscope, and devised by a M. Regnaud, which is an improvement upon our old acquaintance, the zootrope A number of pictures are shown in succession, representing men or animals in the act of leaping and running, and they pass before the retina so quickly as to create the illusion that the men or animals themselves are in motion. In M. Regnaud's instrument the figures are enlarged and shown upon a screen, so that there is less difficulty about seeing them than in the ordinary zootrope. A combination of this instrument with photography is contemplated, and M. Vidal very truly remarks that, inasmuch as Mr. Muybridge has successfully photographed an acrobat in the act of turning a somersault in a series of fourteen views, there should be no difficulty in applying such pictures to the instrument, and rendering it, in this and other ways, of use for study and instruction.

Our readers may not be aware that the late Sir Charles Wheatstone, shortly before his death, was engaged upon work of this character. Nothing was too small to engage Wheatstone's attention, and if an idea seemed likely to bear fruit, he did not wait to consider to what use it was likely to be put. If the result of his labours proved of no value as a practical instrument for every-day use, he was not ill-satisfied if he could turn it into a scientific toy. Several of these owe their origin to Wheatstone, and it is a question whether, in their elaboration, he did not prove himself a greater teacher than many a learned professor in class-room or college, since he imbued the youthful mind with a love for science that was generally lasting. That he prided himself quite as much in the elaboration of a scientific toy as in a grave improvement of the electric telegraph is no secret, just the same as another great man devoted to photography—Sir David Brewster—occupied himself as willingly with problems of natural magic as with the most abstruse question of optics.

We were priviliged to assist Wheatstone in the experiments to which we have alluded. It was his idea to depict a steam engine in motion, by the aid of a series of photographs, and an instrument of his own construction, which, by an intermittent motion, brought the pictures into view one after another. Wheatstone stipulated for a series of thirteen pictures, and to secure these he proceeded as follows:—A steam engine suitable for a model was chosen, and a site selected for the camera, whence fly-wheel, governor, and piston could be well seen, since these required to be the most prominent. The engine, we may premise, was not at work; it had, indeed, to be suitably treated with paint and violet powder to render it a favourable sitter. The circumference of the fly-wheel was accurately measured, and divided into thirteen (for that was

the number of pictures required in the series), and then the first picture was secured. Before the second was taken the fly-wheel was pulled round one-thirteenth its circumference, the governor, the piston, and other portions of the engine, of course obeying the motion, and moving in a corresponding degree; a second picture was then obtained, and so on for the series, until after the thirteenth, the wheel was back again to the position whence it started, or nearly so.

Sir Charles Wheatstone's instrument was of a stereoscopic nature, and the pictures taken were, therefore, stereoscopic also; they were duly mounted and fitted into the instrument. The result was very perfect, so far as the steam engine was concerned, fly-wheel, governor, and piston working with much smoothness. The only drawback was the speed—the engine moved too slowly. It always seemed as if there was not sufficient pressure of steam, and that the engine was about to give over working. The same defect was apparent in a series of pictures which we also prepared for the instrument, representing a soldier carrying out the order, "Shoulder arms!" The man in the picture went through the motions too leisurely, and would certainly have been chid for lack of smartness by his officer. But the principle was found to be good, and we here set down the circumstance as one, at any rate, worthy of record.

Notes.

The Rev. Mr. Statham's pleasant speech on Saturday last, on the occasion of the dinner in celebration of the twenty-first anniversary of the South London Photographic Society, was marked by many happy points, but the happiest of all was the touching allusion to photography in cementing social ties. The photographic portrait was a wonder-working talisman, and in possessing it the claims of friendship were never forgotten; it drew closer the bonds of sympathy, it kept our love warm. How much of effective and tender memory was there embodied in a single photograph!

"And, do you know?" said the worthy President, turning to the art aspect of photography, "I cannot help thinking, when I visit the Royal Academy year after year, that I can trace the influence of photography in the portraits I see there. People may say what they choose about the art-value of photography, it will scarcely be denied that painters now-a-days avail themselves largely of the camera's aid, and it would be foolish, indeed, were they not to do so."

Mr. Whaite, who has the management of Mr. Mayall's establishment at Brighton, has conceived the happy idea of protecting the eye from the ruby light of his developing lamp. His lamp is a large one, provided with a powerful oil flame, and with panes of clear ruby glass; it consequently illumines the studio most completely. He, however, never sees the flame itself, and it is this, particularly, that distresses the eye. To mask the flame, there is hung in the most simple manner outside the lamp a piece of cardboard, pear-shaped in form, which is so adjusted that it gets between the eye of the photographer and the flame. If made sufficiently large, one may move about the laboratory and never catch sight of the objectionable red flame at all.

The photographing of prisoners, which is now in the hands of governors of prisons, is shortly to be put under the charge of the Director of the Criminal Investigation Department at Scotland Yard, who will lay down definite rules to be followed in making the photographs. The models are all to be taken of the same size, and from a certain standpoint, in order that they may present greater facilities for recognition. The time chosen for taking criminal portraits is one month prior to the prisoner's liberation, and as a man is allowed to grow his beard within three months of his release, the resulting picture generally shows plenty of stubble about the face; this aspect is naturally misleading, and the period is therefore to be changed.

The proposed change will, it is hoped, have the effect of instituting a more uniform system of portraiture in prisons. There is no reason why, in the vast albums at Scotland Yard, the sitters should not all be depicted on the same scale and under similar aspects. We trust when Mr. Howard Vincent takes the matter in hand he will make full use of the facilities which photography can give him in this connection.

In speaking the other day of the ability of nitro-glycerine to dissolve gun-cotton, we mentioned that touching the film causes headache. At Ardrossan, where the British Dynamite Company have their works, and where large quantities of nitro-glycerine are made, the workpeople, who are chiefly women, suffer from a species of sea-sickness for days, or even weeks, when new to the work; but the malady, like the unpleasant *mal de mer*, disappears, curiously enough, after a time, in the same way as people become good sailors on a long voyage.

A point of some interest has recently arisen on the subject of giving medals or prizes for photographic portraiture. It is contended, and certainly with a good deal of truth, that if judges are unacquainted with the sitter, they cannot form a correct opinion upon the subject of a portrait. "What a good picture that is of Buggins Brown—precisely the way he always holds his hands," says A, a dictum which B confirms with: "Yes; Buggins Brown, so it is—of course, just like him—those heavy eyelashes are very marked." Consequently A and B give their votes in favour of the portrait of Buggins Brown for the main reason that they have recognised him, while other pictures—just as good portraits in their way—are passed over, simply because the sitters are not personally known to the sapient judges.

Obviously, foreign photographers, or those from a distance, are placed at a disadvantage, for their sitters have less chance of being recognised. We think, on the whole, therefore, that there is some justice in the cry that an award ought never to be made for a portrait, but that the merits of the picture as a study should alone determine its value in the eyes of the judges.

A Graphic School of Engraving is to be established for the training of wood engravers. Recent "processes" of a photographic nature have caused a scare among gravers, and the consequence is a little difficulty in securing competent men for block-cutting just now. But photography having turned out anything but a potent rival, wood-engravers are again at a premium, and, judging by the slight progress made by "processes" during the past ten years, their services will be required for a long time to come.

It is the inability of photography to produce the split line that stands in the way of its displacing the engraver. When a woodcut is once printed upon paper in black-and-white, there is no difficulty at all about reproducing it by photography. But that is not what is required, if the engraver is to be dispensed with. The problem to be solved is to take the pencilled sketch of the artist, whether this is on paper or on wood, and to produce a block that will print in a type press. Of course, if this drawing were composed of black-and-white, like a pen-and-ink sketch, the camera could at once be set to the task; but draughtsmen, as a rule, do not work in this way. They may pencil some sharp black lines, but they make broad grey one oo, where the side, and not the point, of the pencil has been used. The wood engraver reproduces these latter by means of a split line, but the photographer cannot do this; hence his inability to render the idea of the artist.

Still worse is it when the drawing upon wood is done by washes of different tints; the photographer is then yet more helpless, for it is only by a process analagous to Woodburytype or collotype that he can hope to copy at all, and we cannot, as yet, employ these methods in a type press. The practice of applying washes to wood blocks, instead of working upon them with a pencil, is very rife now-a-days, and an engraver of ability is consequently indispensable, for he is required to translate these different tints into line-work.

Topics of the Day.

OLD AND NEW FORMULÆ FOR COLLOGRAPHIC PRINTING.

BY ADOLPHE OTT.

THE formulae for collographic printing or phototype have at last became very simple. The first published were those of Messrs. Ohm and Grossmann, of Munich, who professed to introduce in the second (chromated) gelatine layer, alcoholic tincture of lupulin, myrrh, balsam of tolu and benzol, besides nitrate of silver, iodide and bromide of cadmium! Whether this recipe has ever been tried is another question. Most probably it only served the purpose of evading the patents of the ingenious Albert; a practice especially *en vogue* in America, where such specifications are characteristically styled "salt and pepper patents," *i.e.*, one adds to a reliable composition some substances, to make it patentable, using thus the invention of another under Government protection, without being compelled to remunerate him. In Germany, by the new law, such proceedings are fortunately not possible.

The next formulæ which came to my notice were those of Schrank, Vienna. He coats a ground glass plate with

White of egg	2 parts
Distilled water	1 part

After drying, the plate is immersed for four minutes in a solution of one part bichromate of potash in 15 parts distilled water, it being then rinsed in ordinary water. After a short exposure from the glass side (the coated side lying on a black cloth), the plate is flowed over with a solution of one part of gelatine in two parts of water, and dried. It is then coated with the sensitive layer, which I call "Bildschicht" (picture-layer), consisting of :—

Gelatine	15 parts
Sugar	1½ ,,
Distilled water	90 ,,
Bichromate of potash	3 ,,
Glycerine (to every 15 gr. gelatine)	4 drops

In this formulæ, there are objectionable (1) the intermediate layer introduced between the first and third one, which, not being sensitised, diminishes the adhesion; (2) the introduction of sugar, which diminishes the resistance of the layer, thus allowing only a limited number of prints. Besides, the concentration seems to me too great.

In his "Photoverrotypy," Lemling recommends several recipes for a first film, consisting of albumen, gelatine, and sugar, and a second layer of chromated gelatine, wherein the proportion between gelatine and bichromate may be called a correct one, but which, owing to its concentration, is inclined to a granular texture. But nowhere do we find a hint as to the quality of the gelatine to be selected, nor as to the temperature, which are both of the highest importance.

Professor Husnik, of Prague, was kind enough to give me the following description of his method. For the first film prepare a mixture of

White of egg	8 parts
Silicate of soda	5 ,,
Water	7 ,,

After having been well mixed, they are filtered through gauze. With this mixture matt polished glass plates are coated and exposed to the atmosphere for two days, in order that the silicate may be decomposed by the carbonic acid always contained in the air. There results an insoluble compound, consisting of silicate and albumen, which attains the necessary porosity in being washed under a tap for ten minutes, every trace of soluble albumen with carbonate of soda being thus eliminated.

Plates prepared in this way need not be exposed from the glass side, and may be kept for over a year. The second plate is formed of :—

Extra fine gelatine	5 parts
Bichromate of ammonia ...	1 part
Water	80 parts

The gelatinous solution is first heated to boiling, and upon this the chromate of ammonia is added; but if one prefers not to boil, chromalum to the amount of one-twentieth per cent. of the bichromate ought to be added. The plates to be dried at 35° R.

As regards the preliminary preparation with soluble glass, I would say that it is not free from objections in so far as double the quantity of albumen is necessary, as in the method of Albert; and owing to the fact that the mixture coagulates quickly, it cannot be kept, while a mixture of chromium salt with albumen may be preserved for almost any length of time. Besides, the cleansing of the plates is somewhat troublesome. Immersion in alkaline solutions is not sufficient, they must be polished with emery, which involves loss of labour and time. And as regards the formulæ for the second (picture) layer, I find the solution for one coating almost too thin, and the boiling superfluous. Probably it is the purpose of this latter process to form chromate of oxide of chromium. Some of

the readers of this article may be aware of the fact that Dr. Eder has shown that a fraction of a per cent. of chrome alum is sufficient to increase the sensitiveness of chromated gelatine considerably; such layers, however, do not keep, getting insoluble on the third or fourth day. On the other hand, it is well known among phototypists that the finest prints are obtained when the plate, before being exposed, is three or four days old.

In the method of Husnik, I miss also an indication of the process of "etching." Without such a preparation the plates rarely hold out to two or three hundred prints. Probably M. Husnik will tell me that Obernetter in Munich moistens his plates only with water, which I will not deny. But Obernetter possesses to my knowledge a process by which he is enabled to prepare plates in less time than others, and in such a case it is indifferent whether they hold out to a greater or smaller number of prints.

From Mr. T. H Voigt, in Hamburg-on-the-Heights, a very clever phototypist, I obtain the following formulæ:

Layer 1.

White of eggs	30 parts
Water	25 ,,
Ammonia	10 ,,
Double chromate of potassa ...	1 part

I dry at 20° R. Expose from the glass-side until it has become insoluble. Immerse in tepid water for several minutes a day.

Layer 2.

Gelatine	10 parts
Bichromate of potassa	2 ,,
Bichromate of ammonia ...	1½ ,,
Water	75 ,,

Dry between 30-40° R. Expose under negative, and afterwards repeat exposure from glass-side from one and a-half to three minutes in diffused light; then wash in running water and put aside to dry. M. Voigt renounces the practice of "etching" the plates in printing, but he has recommended to me personally to cover the dried plates with concentrated glycerine, and to let them remain over night, which, for want of other means, may do excellent service. His printer employs water containing a single per centage of glycerine.

Regarding the recipes themselves, I have only to object, that in the second layer the quantity of the chromic salt is too great. Besides, the use of the costly ammonia compound offers no advantage, the same end being attained by adding so much ammonia to the bichromate of potassa bath till it has turned yellow.

As to the composition of the first layer of Voigt, we have seen that it fulfils its purposes perfectly. Let us now see by what alterations we may, on the base of experience, arrive at a really good second layer.

Above everything we need a tenacious gelatine that will not swell much. As such I have found that of Coignet *pere et fils* in Paris one of the best. By the addition of a small percentage of genuine Russian isinglass we may increase the resistance considerably. But this addition must be the less, the smaller the number of prints ordered, and the less soft the negative. With regard to the necessary amount of chromic salt, one-fourth of the quantity of gelatine is quite sufficient.

Weigh 85 parts gelatine Coignet and 25 parts bichromate of potassa, immerse the gelatine for an hour in a quantity of water nine times its weight, the less swelling isinglass over night in a quantity of 14 times its weight; prepare a concentrated solution of the chromium salt (1-10), place both, gelatine and isinglass, in a warm water bath, and pour the bichromate (stirring the while) to it.

This mixture represents our second layer. In a more convenient form it reads as follows:

Gelatine...	85 parts
Water	750 ,,
Isinglass	15 ,,
Water	200 ,,
Bichromate of potassa ...	25 ,,
Water	250 ,,

The plate with the first layer, which need not to be washed, must be heated to 40° C. before the mixture of the second one is flowed over, and the second to 50° C. And here I will take the opportunity of saying that the reader will search in vain for the description of certain manipulations in this article, it being not my task to write a treatise on phototype, but only, as the title indicates, to review several formulæ; besides, the manipulations are best learned by practice. A few words yet on "etching."

The purpose of this is—(*a*) to obtain softer and warmer prints than the plate would otherwise yield; (*b*) to render the lights more brilliant; (*c*) to enable the printer to print without constantly moistening the surface. To this end the following formula has always given me excellent results:—

Glycerine of ordinary consistency	150 parts
Ammonia	50 ,,
Nitrate of potassa, dissolved in 25 parts of water	5 ,,

The plate is covered with this solution for one half to one hour, after it has previously been hardened in a dilute solution of alum (1·150), and dried at ordinary temperature.

If the plate has been over-exposed, add to a mixture of glycerine and ammonia 5 per cent. semi-fluid Venetian turpentine, and wash the surface with it. Many phototypists take calcium-nitrate instead of potassium-nitrate. An excellent printer recommends to me a dilute solution of lithographic stone in nitric acid. Glycerine and oxgall serve the same purpose.

But, reliable recipes aside, three things are necessary in order to become a good phototypist, namely—practice, practice, and again practice!

The "Topic" for next week will be "On the Lime Toning Bath, &c.," by Valentine Blanchard.

"NEVER TOO LATE TO MEND."

BY J. E. WALKER.

I cannot help smiling when I think of the time that I started to practise the "black art." It is now many years ago since I took lessons from a practical photographer, and speculated in a text-book. Thus I commenced my study of photography. It was a singular manner rather in which I came by my apparatus. Having got instructions, I wanted a set of necessary things to work with. I was advised to purchase new ones, but found the expense would be very high. Now, if only I could get some cheap second-hand things, thought I, look what a saving it would be. While still undecided, I visited a small town some miles from my home. I had not been in the place long, and was looking in a shop window, when a well-dressed and very respectable man, about middle age, came up to me, and, in a very friendly manner, began to remark about some pictures. Having my glove off at the time, I suppose he noticed some silver stains on my fingers, for he said, "You are a photographer, if I mistake not?" I replied, I did a little in that line, for I was rather proud of my new hobby.

"I thought so, sir. Going in for a few views, I suppose? Some fine bits about here. Do you know the place, sir?"

I confessed I did not know much about the place and my new friend continued: "Well, you see, some time ago I gave it up myself. I was one of the first about here who practised it. I still have my apparatus, but they are no use to me. You see, I am a traveller, and have no time to take any pictures now."

Here is a chance, thought I; so I asked him if they were for sale. My new friend did not seem as if he cared to sell, but kept on praising his apparatus to me. At last, he consented; and I went to his house. He took me into the room, and I had tea with him, after which we proceeded upstairs, and my friend, opening a box, let me look at his lens and camera, together with other things.

"There they are," he exclaimed; "and finer you cannot get. I have done some fine work with them, sir."

Well, after the examination of the articles, we proceeded downstairs to my friend's best room, where, smoking our cigars together, we passed a very pleasant evening. I need not trouble you with further details, but come to the point at once. I bought the articles, and paid my friend the photographer his price, which was not half what new things would have cost me. I thought I was fairly in luck's way, for this gentleman was so delighted with my company that he offered me the use of his house during my stay at the place. As may be expected, I gladly accepted his kind invitation, and we spent several days in pleasure, visiting all the places of interest in the neighbourhood, fishing, and other amusements. My friend informed me that his wife was from home, and that the lady in the house was one he had engaged to attend to his house. During my visit I stood most of the expenses in return for my friend's kindness.

On the evening of the third day of my visit my friend and I arranged to spend the next day in commencing photographic operations, he promising to put me in the way of working. We went out to the "King," and spent the night in a very pleasant manner. My friend was much jollier than usual, and paid freely for me; we had a game or two at billiards, and then went home. He told me, in confidence, that he had a bill to meet, but was rather short. I lent him £10, for which he gave me a bill on the furniture (it was a splendid house, and well furnished, too). Being late when I went to bed that night, I did not get up so early next morning. Coming down into the room expecting to meet my friend, I met the lady of the house, who said, "Good morning, sir. Your brother left here this morning at five o'clock; the boy assisted him to the station, and he sent word back we were to tell you he was safe off. Your breakfast is ready, and by the time you are ready for the eleven o'clock train I shall have all your luggage packed ready for you, as he told me you were going to join him to-day. To save time, I have made out the bill for you; here it is. Your brother was here three weeks before you joined him."

To say I was surprised will convey a poor idea of my feelings at the time. I tried to explain that I was not his brother, and how I was there; but it was no use, she ouly got into a temper (and she had a temper, too); so, rather than suffer the severity of a woman's tongue, I paid the bill, and left with all speed.

Arrived at home, I set the detectives after my friend for his unkindness, determined to have my money back, or revenge, if possible. I tried the apparatus, but found, after a great deal of expense and trouble, that they were useless things. A new set of good apparatus was purchasep from a respectable house, after which I had no difficulty.

Let the inexperienced take a lesson from my experience, and get the best at first, or get an experienced person to purchase for them. Always avoid those photographers, as they call themselves, who have retired from the profession, and have some firstrate "things" for sale; particularly if they are travellers, as my friend was. Do not put too much confidence in a man because he is a photographer. If ever my friend and I meet in this world, I shall let him see that "it is never too late to mend"—his ways.

Correspondence.

PHOTOGRAPHY BY GASLIGHT.

Sir,—In your "At Home at Mr. Laws'" in which you describe photography by gaslight, you do not mention the cost of apparatus and burner. I hear that the Wigham burner that Mr. Laws employs costs about £5. Is this about the figure? Then what is the cost of constructing the reflector, from first to last, as Mr. Laws has it, with the blue glass screen you speak about? By answering these questions you will much oblige,

A Working Photographer.

RECEPTION ROOM DUTIES.

Dear Sir,—I am much interested in the correspondence which has appeared lately in your journal on the subject of reception room duties, and I feel impelled to say a little on the subject—one, I am sure, very interesting to a great number of your readers. My experience has been gained during seven years' labour in a quiet select West End business, and I think a few words from me may not be out of place in your journal, and may help to draw photographers' attention to some of the difficulties attendant on reception room duties. They are many and various, but all, it must be acknowledged, more or less trying to the temper. It requires a large amount of patience to endure, day after day, the selfishness and vanity constantly displayed, and to quietly submit to the loss of much valuable time in useless trifling, mostly resulting in nothing. Besides the care of the reception room itself, and the other duties generally intrusted to the lady, there is much required of her in the management of sitters, for great tact is necessary in dealing with them; any one who has had experience knows that no absolute rule can possibly be laid down in such matters, and that while the principal is occupied in his studio, the entire responsibility rests on the person in charge of the reception room. If the rule of payment at the time of sitting were universally adopted, and carried out without infringement, how great would be the advantage, how much less the work and duties, devolving on the lady in the reception room, and how much larger the receipts at the end of the year to the proprietor! My experience certainly tends to show that the public do not consider the photographer's time valuable, and fail to see their indebtedness to him if the result prove not as flattering as their vanity, aided by the looking-glass, leads them to expect. Sitters of this class are only too well known to all photographers. When visiting a studio they express unbounded astonishment if the subject of payment be mildly suggested, and usually announce their determination to first see results; yet at the door of a theatre they never make the plea that they must first see and approve the performance before payment, or, at the booking office of a railway, state that they would prefer to pay at the end of the journey. One fact must have struck all photographers, and that is, how easily pleased is the sitter who has first paid, and how seldom a resitting is asked for, whilst it is only too well known that those who have not paid, make and re-make appointments for re-sittings, and sometimes never complete the transaction at all. Such is my experience. I only hope it is not that of all photographers. Feeling strongly on this subject, I cannot help thinking photographers have themselves chiefly to blame for this unsatisfactory stateuof things.—Faithfully yours, G. G.

COMMERCIAL PLATES.

Sir,—Cannot manufacturers be persuaded to employ better glass for their films? The plates are of all thick-

nesses, and some have cruel jagged edges, that it is a marvel to me how I escape sometimes unhurt. Would it not be well to have two qualities? For myself, I am a very slow operator, and I would readily pay for patent plate and ground edges if there was a guarantee to that effect by the maker. Cheap plates are a great advantage to many, but there would be plenty of sale for those at a dearer rate if better prepared. I hope this hint will be acted upon.—Yours, ONLY AN AMATEUR.

July 24th, 1880.

Proceedings of Societies.

South London Photographic Society.

On Saturday last forty members and friends dined together at the Holborn Restaurant to celebrate the twenty-first anniversary of the Society, and also to commemorate the fact that the Rev. F. F. Statham, M.A., F.G.S., had remained during the whole of that period the President.

Mr. Jabez Hughes was appointed to the chair, and after justice had been done to the good things provided he proposed the usual loyal toasts. In proposing the toast of the evening, he said he was very pleased to occupy the chair on such an important occasion, although it seemed an anomaly to have the President on his right. He (Mr. Hughes) then went on to state that when the South London Photographic Society was started, there were fourteen other societies in existence, not one of which now remained except the Parent Society, and even that had to change its name to keep its position. He was also pleased to see several present who had been at the inauguration of the Society, also many who were elected during the past year. Mr. Hughes then remarked upon the various places of meeting the Society had found, till at last, through the kindness of the late Peter Le Neve Foster, they had settled down at the Society of Arts. Mr. Hughes, in alluding to the "children," as he might say, of the Society, mentioned the Exchange Club, introduced many years ago by Mr. F. Howard. A field club was also started by the same gentleman. The Photographic Benevolent Society also originated from the South London Photographic Society. In speaking of the President, Mr. Hughes said many would recall the pleasant evenings spent at the President's house, the kind invitation having extended year by year almost through the whole existence of the Society; but this year the Society entertained their President, and he was pleased to see so many gathered round to do him honour. Mr. Hughes went on to say that many societies took their presidents from the gilded nobs of society, and seemed content if they put in appearance now and then, whereas the President of the South London would be found to be the most constant attendant at all the meetings. Mr. Hughes then gave a long resumé of the work done by the Society during the twenty-one years, and concluded his speech by proposing, "Health and Prosperity to the Rev. F. F. Statham."

The toast was drunk with great enthusiasm.

The Rev. F. F. Statham, in reply, said that the speech of Mr. Hughes had carried him back in imagination many years, so many having been cut down who had done good service to the Society, notably Mr. G. Wharton Simpson, Mr. O. G. Rejlander, Mr. Henry Cooper, and others. The rev. gentleman, in alluding to his duties as President, said that they had been lightened by the universal kindness he had always experienced from the members, and he thought it was from this kindly feeling that he owed his long continuance as President, rather than to his knowledge of photography. The social element had been largely introduced into the Society, and certainly had done a great deal in cementing the members together. In conclusion, he begged to thank the members present for the manner in which they had drunk his health, and said, as long as he was spared, and they chose to elect him, he should feel pleased to fulfil the post of President.

Mr. J. Hughes rose, and said he had hoped to have had the pleasure of proposing the originator of the Society—Mr. Alfred Wall, and Mr. W. Ackland, both of whom, he was sorry to say, were unavoidably absent; but they had present with them the original treasurer in Mr. F. Howard. He would, therefore, propose the health of Mr. F. Howard, coupling also the names of Messrs. Sebastian Davis, Martin, E. Foxlee, and J. Spiller, who had all done good work and true for the Society.

Mr. F. Howard, in returning thanks, said that when the Society was originated, it consisted of a large number of amateurs who had created its reputation. He, therefore, on the part of the amateurs, begged to thank them for associating his name with the toast.

Mr. S. Davis, in returning thanks, said that he considered that the great difference between the parent Society and the South London was that at the former principles were enunciated; the latter carried those principles into practice.

Mr. J. Spiller said that, when a member, his great pleasure was in having the advantage of working under such a President as the Society possessed, and in conclusion proposed the health of Mr. Edwin Cocking, who for many years had been Secretary, and rendered such able service to the Society. He also begged to couple with this toast the name of Mr. Garrett Cocking, who gave promise of carrying on the work of the Society in as able a manner as his father had done.

Mr. E. Cocking and Mr. H. Garrett Cocking having returned thanks, Mr. J. Hughes proposed the "Photographic Press," associating with it the names of Mr. H. Baden Pritchard and Mr. W. B. Bolton.

These gentlemen having responded,

The Chairman proposed the health of Mr. F. A. Bridge, the present treasurer.

The Rev. F. F. Statham then, in a few chosen words, proposed the health of the Chairman, who having briefly responded, the proceedings terminated.

During the evening songs and recitations were given by the members and others.

Manchester Photographic Society.

On Saturday, July 10, the first outdoor meeting of the Manchester Photographic Society took place, and although there were many absentees, the meeting proved exceedingly enjoyable.

The place selected was the valley of the River Bollin, and although we did not expect very magnificent scenery so near Manchester, those of us who had not been there before were agreeably surprised at the many charming views which seemed to lend themselves to photographic treatment.

Mr. Cook, our worthy treasurer, had been over the ground previously, and was a good guide.

Having come with the intention of making the most of our half-holiday, we all were most unanimous in the desire to secure some good work, and also to enjoy to the full the exceeding pleasant ramble.

For some time we trudged along the country lanes, delighted with everything around and about us, until, reaching some rising ground, on which stood an old thatched cottage, the view from which, looking back in the direction we had come, was so inviting, we were all seized with a desire to begin work; so cameras were unpacked forthwith, gelatine plates being greatly in the ascendant. The tenant of the cottage being in his garden, he was asked to pose himself in front, which he accordingly did. After a little chat we continued our walk through the pleasant fields to the valley, before reaching which, however, we came to a path which was so very suitable to the taking of a group, that two of the members suggested taking the portraits of the rest, which was accordingly done. We then journied on, seeing many first-rate views, to our intense delight; some of them were photographed, others we were content to look at and admire. And, indeed, there was much to admire in the scenery around, which was pleasantly rural in its character. The trees were abundant, and with little labour it was found possible to get in the field of view some very artistic pictures. The undergrowth was very abundant, consisting of grasses, ferns, foxgloves, nettles, &c., &c., all of which made charming foreground studies.

At the farmhouse on the route, while most of the members were drinking milk, Mr. Coote took the photograph of a very angry dog on a gelatine plate. A little past this place we came to the only difficulty on our ramble; it was a portion of the path, which was on the slope towards the river, and from some cause or other was one complete mud hole; there seemed a likelihood at one time of some of the members sticking fast, or

being thrown headlong in the mud, by reason of the legs of the tripods and their own becoming mixed. One member caused a hearty laugh by calling out, "I've lost my leg;" meaning one of the legs of the stand. However, like most things, the puddle came to an end, and we found all safe and sound on looking things over. Immediately after this we came upon the most charming miniature pool it had been our lot to see; it was not more than a dozen yards across, and yet, with its surroundings, it made up a picture worthy of the highest artistic treatment. After this there were not many more plates exposed, though there seemed scope for many very good pictures being made, both near foreground bits, and distant views. We passed through a grand wood, seeing pictures at every turn; but it was now late, and the members were beginning to wish for the resting place. Very soon after the welcome hostelry was reached, and a substantial tea was set before the men, who, by reason of the delightful ramble they had enjoyed, were prepared to do full justice thereto.

Talk in the Studio.

Photography by Gaslight.—In a communication forwarded just as we are proceeding to press, Mr. P. M. Laws informs us that the burners used in the Clock Tower of the House of Parliament are similar to the one used by himself, and were erected many years ago by Messrs. Edmondson and Co., of Dublin. We learn further that Messrs. Mawson and Swan have taken the sole agency for Great Britain and Ireland for them.

Sheffield Photographic Society.—This Society will hold its meetings in future at the Freemason's Hall, Surrey Street, on the first Tuesday in the month, at half-past seven. Annual meeting in October.

A Photographic Dispute.—In this action, last week, Mr. Dixon, a photographer, carrying on business at 112, Albany Street, sued the defendant, Mr. W. Ward, a pianoforte manufacturer, of 100, Great Russell Street, to recover the sum of £4 odd, being the value of two proofs from a negative taken of one of the defendant's pianofortes, as well as for the negative itself. The defendant said that it was distinctly understood that the negative should not be charged for in the account charged. The plaintiff contended that it was preposterous to say that he would execute at the price the defendant wished to pay. The negative was charged at the lowest possible charge, seeing that the defendant could print several copies, by which he might secure a considerable income. His Honour said it was preposterous to suppose that a negative supplied to the defendant was not of material value. There was no doubt that the charges for the proof were fair and reasonable, and the charge for the negative was equally so. Under the circumstances he considered that the plaintiff was fully entitled to recover the full amount; his claim as obtaining a negative apparently never entered into the contract; and if it had, the plaintiff would be fully entitled to the amount he claimed. Judgment was entered accordingly for the plaintiff for the full amount claimed.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

Tyro.—The line of experiment you are engaged upon is well worth pursuing, and we should like to be favoured with your further observations when ready for publication.

An Enquirer.—The addition of a trace of tincture of iodine to the collodion will generally overcome a tendency to fog. You do not say whether the collodion with which you "refilled the pourer" was old or freshly brom-iodized; if the latter, this was certainly the cause of all the subsequent plates fogging. Yellow spots on recently sensitized paper are to be accounted for by traces of hypo or dust of pyrogallic acid getting into the sheets of blotting-paper between which you say they were preserved over night. Try and wait until they are dry, and lay them together under pressure until the morning, thus avoiding the use of blotting-paper.

Gustavus Mace.—Under the conditions described in your note and accompanying sketch, we should be disposed to advise you to build your glass house on the following plan:—The length, 21 feet, permits of your taking off, say, 3 feet 6 inches at either end for the dark chamber, that is, if no spare ground for this little room can be got on the north side, which you say is "open." It would be desirable to lay the flooring a foot at least off the ground, and more, if surrounding buildings interfere at all with your lighting. The north aspect is best to work by in all seasons, so keep this for your main light, and fully glaze it, making a double ridge roof, with the apex considerably thrown over towards the south, so as to give plenty of top light in case you want it. It is easily screened off at midsummer, and comes in very handy in winter. The south wall to the eaves and up to the ridge should be permanently closed in, and likewise the ends of the room; you can then have double backgrounds, and work either way—a great convenience for pairs of portraits. With a good width (10 feet) you may have the eaves on north side, say 6 feet 6 inches from floor, and a foot or more higher on the south side. The dark room need not occupy the entire width, so that there would yet be space for the entrance doorway at the same end of the building.

R. O. B.—We have noticed at times the needle-shaped crystals you mention as being formed in the alkaline pyrogallic developer, but, not having analysed them, we cannot say of what they are composed. Bromide of silver is known to be slightly soluble both in ammonia and alkaline bromides.

A. B. K.—See Photographic News of the 27th Feb., page 100. You will see the proper strength of solutions for intensifying gelatine plates as used by Mr. England.

H. Bray.—Carmine or lake red is usually employed. For matt varnish, take—

Sandarac	½ ounce
Canada balsam...	1 drachm
Sulphuric ether	7 ounces
Benzole	3 ,,

See an article in our Year-Book for 1873 on the subject.

Rich. Huck.—Thank you for communication. Our columns are rather crowded at the present moment, but we may have room shortly.

An Amateur (Bristol).—A light coating of wax or india-rubber varnish should aid you in securing better adhesion to the plate during development. If not either of these, there is no other way than edging with clear varnish.

An Old Hand with a Poser.—The advice given to the preceding enquirer may be in part applicable to your case, but from the admirable specimens forwarded, printed, as you say, eighteen months or two years ago, it is clear that all ordinary precautions were taken. We have known these spots to be almost inseparable from the practice of photography at the seaside. Is this your case? Judging from the marine views sent, we think it likely that the sea air is responsible for traces of chlorides getting into the paper, and by inducing moist conditions bringing about the first indications of fading. It is well known that show-cases at the seaside have to be made extraordinarily tight to exclude sea spray and moist air.

Pyro.—The intermediate transparency for producing an enlarged negative may very well be a carbon print developed on the glass; or, as Dr. Monckhoven showed some years ago, the collodio-chloride process may be employed. For collodion transfers you would use an ordinary negative.

G. W. Hale.—The cartes and cabinets pourtraying incidents in the Plymouth Regatta of 1878 are certainly very creditable, and prove, as you say, the capabilities of wet collodion. The fact remains, however, that gelatino-bromide plates are even more sensitive, and if you propose resuming your camera work at the present time, we should advise you to give the newer process a trial.

G. Morgan.—1. Comparing the formula with that given by Capt. Abney on the 21st May last in the News, we should say the gelatine emulsion, when washed and filtered, ought to measure about 7 ounces. 2. The maintenance of an uniform temperature in the room and drying chamber is all-important at the time of coating your gelatine plates. On this point, see an article by M. Bascher in our next, from which you may glean many valuable suggestions, and which may help you through your troubles from frilling.

PATENTS.

COMPILED BY DES VŒUX AND COLTON.

Patent, Trade Marks, and Photographic Copyright Office, 32, Southampton Buildings, Chancery Lane, London.

3006. William Robert Lake, of Southampton Buildings, London, "An Improved Apparatus for Applying a Gelatinous, Resinous, or Similar Coating or Covering to Photographic Plates and other Articles." A communication to him from abroad by George Eastman, of Rochester, New York, United States of America.—Dated 21st July, 1880.

The Photographic News, August 6, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PANORAMAS AND PHOTOGRAPHY—PERIPATETIC PHOTOGRAPHERS—PHOTOGRAPHY BY GASLIGHT—PHOTOGRAPHIC SOCIETIES OF THE PAST.

Panoramas and Photography.—A novel application of photography to the production of panoramas is contemplated in Paris. M. Adolphe Yvon, a well-known French artist, following the example of M. de Neuville, has gone to the Zulu war for a subject for his canvas, and is now engaged on a painting of the battle of Ulundi, which is intended for a panorama in Oxford Street, to be opened next May. The scene is taken from the centre of the British position, and M. Yvon has chosen the critical point of the engagement when firing is going on on all sides, the Zulu Kraal being in flames, and the Lancers rushing on to the foe. The panorama will be on the same principle as that of the Siege of Paris, which for years has been such an attraction for visitors to the French capital, and will be 130 feet in circumference, the spectator being placed 15 yards from it, and the intermediate space filled in with real objects to assist in the delusion. M. Yvon's painting is to be reproduced in tenfold size by means of magnified photographs, which, being thrown by the electric light on to the canvas, half a dozen artists can trace the outlines with great speed and accuracy. The panorama will, without doubt, be one of the sights of the metropolis.

Peripatetic Photographers.—The preservation of open spaces in the metropolis, and the byelaws framed by the conservators, are hailed with joy by all classes save the peripatetic photographers. To them the preservation of Hampstead Heath, Clapham Common, Peckham Rye, and other "commons" means that their occupation is gone. But the photographer dies hard, and though the valiant De Morgan has not taken up his cause, he is evidently determined to fight the matter to the bitter end. For several years the Conservators of Peckham Rye have been carrying on a sort of guerilla or intermittant warfare with an obstinate knight of the camera, who insisted that he had his rights as well as the commoners, and refused to comply with the order of the constable—not to "move on," but to "move off." The Vestry of Camberwell was much exercised in its mind what to do with its doughty adversary, and at last had to call in the aid of the magistrate, and the photographer had ultimately to succumb to the majesty of the law. This, we fear, will be the fate of Mr. Hutchins, now engaged in a fierce controversy of similar kind with the Metropolitan Board, who, as their weapons in the shape of warnings and prohibitions have failed, have been obliged to go before the Hampstead magistrates and ask their assistance. The Board was represented by its legal adviser, but the defendant had a much more powerful advocate in the shape of his wife, who appeared for her lord and master, and, we doubt not, defended his interests very much better than any barrister could have done. The Bench have adjourned the case for a month, and we are curious to see what will be the result. It would be too bad if this touching instance of wifely affection had an unpoetical termination. Feminine logic is a match any day for legal reasoning, and Mrs. Hutchins deserves to succeed. By the way, what an admirable subject for the imaginative faculties of the members of the South London Photographic Society this incident presents for one of their friendly competitions. The photographer's wife before the Hampstead Bench pleading for her husband would, we fancy, offer some scope for the play of fancy.

Photographing by Gaslight.—As was stated last week, the suggestion made in this page a fortnight ago with reference to the gas burners used in the clock tower of the House of Parliament has been anticipated by Mr. P. M. Laws, whose burner is similar to the one employed at Westminster. We recur to this subject because gas, being so ready to hand, would seem to offer the most convenient mode of artificial lighting for photographic purposes, provided the requisite rapidity could be obtained. So far as the illuminating powers of the material itself is concerned, the albo-carbon light would seem to be the best. It is well known that when gas is subjected to pressure, which it has to be in the storing cylinders, the compression being from sixty to seventy pounds to the inch, or when exposed to cold or freezing temperature, or when conveyed in pipes passing from a warm to a cold atmosphere of 40° Fahr. or lower, it suffers a loss of illuminating power arising from the deposit of napthaline, an important element in the illuminating value of gas. The principle of the albo-carbon lamp is that it supplies this loss by passing the gas through vapourised napthaline, a quantity of which it takes up. The resultant light is intensely white and mellow, and the ordinary flame looks quite pale and sickly by the side of it. A portion of the Westminster Aquarium was some time ago lighted by it, and with great success. The drawback to its use in private houses is that the napthaline requires to be warmed in order to vapourise it, and the apparatus is not particularly sightly. There would not, however, be any objection from this cause to its use in the studio. It is possible that even this drawback may be removed, as Messrs. Sugg and Clark, the patentees of the well-known London Argand burner, suggest that similar means for increasing the illuminating power might be employed by the companies themselves. They propose to effect this by adding to the gas hydro-carbon vapour, which possesses the property of preventing the formation of the napthaline crystals by holding napthaline in solution, and also supplementing the hydro-carbon already contained in the gases. The mode in which they propose to treat the gas to obtain this result is to pass the poor coal-gas after purification, or before any deposit of the napthaline takes place, over the surface of a liquid hydro-carbon contained in a suitable vessel inclosed in a jacket and heated to about 60 or 70 degrees by means of hot water. The gas, in its passage over the hydro-carbon, takes up the vapour which is given off, and it is then conducted by suitable pipes to a retort and heated to about 900 degrees. After heating the gas is drawn off by a pump, and either passed to a gas-holder, or direct into the mains for the purpose of enriching the gas therein, and is compressed in a very suitable manner into cylinders for use. Whether the plan suggested by Messrs. Sugg be the best that can be desired or not, it is obvious that with the almost weekly improvements in the electric light the gas companies must exert themselves to produce a much better quality of gas than they have hitherto sent out, and any improvement in this direction must have an important bearing on Mr. Laws' experiments.

Photographic Societies of the Past.—Photographic societies in the early days of the art must have been fearfully and wonderfully made. We have before us an interesting relic of the past in the shape of the byelaws of an "American Daguerre Association," founded in New York, in 1851, the year of the death of the discoverer of the process which bears his name. The byelaws consist of fourteen lengthy "articles," and would occupy in space at least two pages of the News. There are rules for the guidance of the president, the vice-president, the recording secretary, the corresponding secretary, the treasurer, the discretionary committee, the finance committee, and the printing committee. The article relating to "members" contains eight sections, a most notable one being Section 3, which ordains that "no person shall be eligible to membership who publicly advertises low-priced pictures, by signs, or other means." There is a formidable list of "fines and penalties," ranging from one to ten dollars, to keep the secretary, the corresponding secretary, the treasurer, and the various committees up to their work, the members being let off with a solitary fine of one dollar "for not reporting change of residence or business, as per article 8, section 6." There is an awful and altogether mysterious body termed the "Board of Honour,"

whose duties are to "take cognizance of all differences arising at any meeting of the Association among the members that may be referred to them and not coming within the reach of these byelaws." It is satisfactory to find that this Board of Honour had no power to impose any "monied fine"; but as to whether they could impose any penalty not "monied," we are altogether in the dark. Article 13, relating to "order of business and rules and order of debate," is a most stupendous affair. It contains no less than nine directions for the order of business, four rules for the conduct of the debates, the fourth rule being further subdivided into seven alternatives, and nine miscellaneous orders to meet any possible contingency which may arise during the progress of the meeting. Article 12 is so unique in its way we cannot forbear quoting it. It is headed "Funeral Honours," and says: "On the death of a member, it shall be the duty of any member having cognizance thereof to report the same immediately to the standing committee, that such measures as may be advisable may be entered into." With all this elaborate paraphernalia, what a dreadful responsibility it must have entailed to have been a member of the "American Daguerre Association!"

ON THE USE OF COAL GAS IN PHOTOGRAPHY.

BY AN OCCASIONAL CORRESPONDENT.

The use of coal gas for lighting the sitter by Mr. Laws, of Newcastle, appears to us to constitute a new epoch in photography, and to be one of the most important improvements which has been made since the introduction of gelatine plates, of which, indeed, it is a direct consequence.

The use of the electric light rendered the professional photographer independent of solar radiation, but at what a cost for the installation and maintenance of the substitute! Here we have solar light superseded without the expensive magnetic-electric engine in the motive power. Our source of force is already within our reach, and we have only to find the best method of utilising it. Our efforts must be directed to obtaining from the gas the whitest—or, more properly speaking, the most actinic—flame which it is capable of yielding, and there are, at least, two chemical methods of greatly enhancing the light of pure coal gas, which do not appear to have occurred to Mr. Laws, both of which, we think, are applicable to his apparatus at a very slight cost. To make this apparent, let us consider the principles involved in the operation of burning gas for illuminating purposes.

The ordinary flame of burning hydrogen—by which we mean that emanating from the combustion of this gas and atmospheric air—is scarcely visible, notwithstanding the great heat produced thereby.

We may, however, render that flame highly luminous by the introduction within it of a coil of platinum wire; by causing it to impinge upon a solid refractory body, such as a piece of calcium- or magnesium-oxide; or, still better, by previously passing the hydrogen through, or over, the surface of a liquid hydro-carbon, such as benzine, in which case it takes up a volume of the highly carbonaceous compound, and white light is the immediate result of its combustion.

A comparison of experiments of this nature has led to the conclusion that the light obtained by combustion, under ordinary circumstances, is due to the presence of solid matter in the flame, heated to a very high temperature—or, as it is called, to a state of incandescence—and that the intensity of the light bears some direct relation to the degree of heat which the apparatus used enables us to attain.

In the first case the solid incandescent matter is platinum; in the second, lime, or magnesia; and in the third, unconsumed carbon.

Coal gas is chiefly composed of hydrogen, and light-carburetted hydrogen or marsh gas; but these alone would yield us very little light in combustion. It also contains some olefiant gas, and a small quantity of what are called the heavy hydrocarbons, in a state of vapour; and although but a comparatively small per centage of these latter substances are present, they and the olefiant gas are the real sources of the illuminating power.

It is obvious, therefore, that if we treat ordinary coal gas as we treated hydrogen in the third case, we shall very greatly increase its efficacy for lighting purposes, for atmospheric air itself becomes combustible and luminous when similarly treated.

Formerly, and before Perkins' great discovery of his aniline dye, the precursor of so many other tinctorial compounds derived from coal-tar, the burner of the street lamps in many parts of London might be seen with a small conical vessel intervening between the supply-pipe and the burner, and this contained a bit of sponge or bundle of cotton wool, partly saturated with naphtha, distilled from coal tar, thus utilising an article for which but little other use was then made, and thereby greatly diminishing the quantity of gas consumed by the Company in carrying out their contract for lighting the streets.

Now, this is the suggestion which we venture to make for the purpose of enhancing Mr. Laws' light, unless, indeed, he has already adopted the well-known expedient. In applying it, however, there are some precautions to be taken by those who may adopt our hint. To derive the maximum effect from gas, a definite quantity of air must be used, and as the quantity is usually regulated by the draught of the chimney, this must be of a specific length for a specified quantity of gas consumed. It must, in fact, be neither too long nor too short. If it be too short, the flame will smoke—that is, give off unconsumed carbon; if it be too long, the air will be in excess, and the quantity of gas consumed will not yield all the light it is capable of yielding when the quantity of air is properly adjusted. If, therefore, these conditions have been fulfilled with the gas as it issues from the main, and before being passed over the benzine, a murky smoky flame will be the consequence of such passage, and the supply of air must be greatly increased by increasing the draught, in order to accommodate the supply of air to the increased quantity of carbon. The phenomenon referred to is familiar to all who use a Bunsen's burner; when the gas burns mixed with air, as it is intended to be, the flame is blue, thin, and non-luminous; but when the air-holes of the outer tube are stopped, or when the gas by accident becomes lighted as it issues from the jet unmixed with air, an offensive smoky flame is seen, unconsumed carbon and hydro-carbons being evolved. The light of combustible matter, unlike its heat, cannot be measured by the amount of oxygen consumed, for heat is the result of the most perfect combustion, whereas light results from imperfect combustion.

Probably the best way of obtaining this adjustment between the atmospheric air and gas, if our suggestion be acted on, will be to employ a chimney long enough to obtain nearly perfect combustion of the gas, and upon the end of it, or within it, to place a damper or valve for regulating the draught, and to gradually close this until the flame begins to smoke, or to show by its deepened colour that this point is near; then again open the valve till the best result is attained.

The second method of increasing the illuminating power of coal gas to which we alluded is to greatly increase the temperature of the incandescent carbon, by heating the air before it is brought in contact with the gas. It was the use of this expedient, under the name of the "hot blast," by which Neilson, of Glasgow, so greatly improved the manufacture of iron, reduced the cost of its production, and for which, after protracted litigation, he secured more than one hundred thousand pounds from the combined iron masters, who had largely adopted his process. We believe that the principle was first applied to illuminating purposes by Dr. Frankland, the eminent chemist; and it has lately been adopted for increasing the heat of the blow-pipe flame by Mr. Fletcher. We have not space to describe its application to lighting purposes in our present number, but may refer to it on a future occasion.

At Home.

MR. ALDERMAN MAYALL AT KING'S ROAD, BRIGHTON.

"The 9th of January, 1840," said Mr. Mayall. We had asked our host the date of his first handling a Daguerreotype, and this was his reply. "You know Goddard suggested the employment of bromine in 1840 in conjunction with iodine for sensitizing the silver plate; well, although I was one of the first to employ bromo-iodide of silver, I practised the slower process with iodine alone, when I began photography." Mr. Mayall came to England in 1845, and then commenced that war between him and Mr. Beard on the subject of the Daguerreotype patent. The process had been improved, added to, and modified so much since the patent was granted, that it could scarcely be deemed the same thing. In 1851 Mr. Mayall made his great *coup*, and his pictures of the International Exhibition, which many of our readers have seen, brought him at once to the front rank. The Prince Consort was especially kind, and took Mr. Mayall by the hand, consulting him now and again upon the rapid strides which photography began to take. When it was suggested, in 1855, to Lord Panmure that the camera might be made a useful observer upon the field of battle, it was to Mr. Mayall our military authorities turned for advice. Two young officers, Ensign Brandon and Ensign Dawson, were selected to perform the duty of military photographers, and these were ordered to report themselves to Mr. Mayall for instruction. So spiritedly did everybody enter into the work, that within a month these officers had been tutored and equipped for duty, and despatched to Sebastopol. The pictures sent home by the young military photographers are still to be found in the archives of the War Office, together with the fine prints secured at the Crimea by Roger Fenton and Robertson.

On the occasion of the wedding of the Prince and Princess of Wales, Mr. Mayall accomplished a feat which, seventeen years ago, made considerable stir among photographers. He was commanded by Her Majesty to proceed to Windsor to take a series of pictures of the Royal pair, of the bridesmaids, and other illustrious visitors. The command reached him but forty-eight hours before the time fixed for the wedding, and how he was to make arrangements for so much work was a problem not easy to solve. There was no corridor or conservatory at Windsor suitable for the purpose, and all the authorities could offer him, in reply to his telegram, was a canvas marquee. Bridal dresses of glaring white are at all times difficult subjects for the camera, and to photograph a score or two of them in a marquee, and photograph them well, was a task only to be contemplated by a strong man. In a frame of mind less complacent than his wont, Mr. Mayall was hunting in a hansom cab along the New Road, to get together, as speedily as possible, the numerous requisites for his responsible task—for heirs to the throne are not married every day—when he caught sight, in one of the long front gardens of that thoroughfare, of a spacious glass house for sale, with the notice, "Can be erected anywhere." The cab was stopped, the builder called, and the price asked. "I'll purchase," said Mr. Mayall, "if you will pull it to pieces and set it up for me at Windsor by ten to-morrow morning." The builder was an enterprising man, and, learning its object, at once caught the bridal infection, and gave his hand on the bargain.

We sat in that glass house, now a trim little conservatory, not so long ago, and, amid scarlet pelargoniums and purple heliotropes, and in a dewy atmosphere redolent with perfume, Mr. Mayall told us its history; for after the structure had done duty so well at Windsor, our host carried it off with him to make an adjunct to his own dwelling. The series of bridal pictures of the Prince and Princess of Wales and bridesmaids taken by Mr. Mayall on that occasion are historical, and need no comment on our part, and, from their popularity and wide-spread publication, it can readily be imagined that the photographs brought their producer some profit; but there are few who guess the extent of the sum that actually was realised.

We have shown that Mr. Mayall is intimately connected with the history of photography; but there is one other reason why you cannot set foot into his studio without thinking of "old times." There is, probably, no other photographer who possesses such an extensive collection of negatives of bye-gone celebrities. Here is the Prince Consort, quiet and dignified; here, two tough Chancellors of the old school—Lord Lyndhurst and Lord Brougham; on another wall there is Kossuth, and further on Lord Palmerston, Marshall Pelissier, the late Lord Derby, and Earl Russell, Sir J. Herschell, Sir David Brewster—nay, even a picture of Daguerre himself is to be espied in a corner. The value of some of these negatives is very great, and here is a wrinkle we may mention out of hand, which our readers will do well to make a note of. You can hardly keep a stock of glass negatives a quarter of a century, especially if you print much from them, without running some risk, and with the best care in the world, they occasionally get cracked and broken. Of Mr. Mayall's costly collection there are some in this condition, but still, strange to say, the prints exhibit no sign of the defect. And for this reason: all cracked negatives are printed by themselves, and in a singularly ingenious manner. There is a simple roasting-jack on the printing roof, and from it depend four cords holding up a square board by its corners. When the jack is wound up, this board revolves first one way, and then the other, and cracked negatives laid upon it to print, leave no record behind them of the defect. For vignette printing, whether cotton wool or glass masks are used, this mode of proceeding should be very valuable, and we commend it strongly to our readers. A jack may be purchased for a few shillings, and does not require to be wound up more than four times an hour.*

To Mr. Whaite, Mr. Mayall's manager at Brighton, we have to tender our best thanks for all we saw in the way of practical working. "This is one of our studios," said Mr. Whaite, as we ascended to the first floor. We looked in. It was a spacious drawing room with two windows, with couch, table, and mantel-piece within eight or ten feet from the light. That there should be no deception, Mr. Whaite insisted on posing us upon the sofa, and taking a portrait forthwith. "I am employing a landscape lens, and I am not sure of the sensitiveness of these plates, as they are some of a batch I made last night, so I shall stop down, and give you fifteen seconds." And in less time than it takes to write, a drawing-room picture was secured. A white screen, placed on the shadow side to reflect back the light from the windows, was the only adjustment necessary.

"In making gelatine emulsion," said Mr. Whaite, "I always prepare four or five small batches rather than one large one. I then test, and, as they turn out in sensitiveness, I mix. A batch that shows tendency to fog is cured of the evil by mixing with a comparatively insensitive batch, and so on. I always test with a landscape lens well stopped down, for it is only by means of a long exposure that you can thoroughly get at the qualities of your emulsion."

We went upstairs to the ordinary studios. They are three in number. "Sitters for portraits are requested to place themselves as much as possible in the hands of the artist," is a notice conspicuously placed. A feature of these studios is the cameras. They are all fixed upon heavy cast iron stands, and stand and camera are never severed. The stands, though heavy, being upon small wheels, may be moved smoothly and with ease. On no account are cameras to be dismounted, is one of the rules of the

* Mr. Tulley has commented on the utility of the roasting jack in a similar connection.

establishment. The lenses are very carefully hooded, and, moreover, the end of the glass room at which they are worked is very dark. But how, it will be asked, if one end of the room is always dark, can a sitter be depicted from one side or the other of his face, as may seem desirable? Mr. Mayall gets over the difficulty in a very simple fashion. His studio rises right above the Brighton houses, and on one side faces the sea; there is consequently plenty of light. Two of the studios are built parallel, and only divided from one another by a heavy tapestry curtain. In the one you have a westerly light; raise the curtain and walk into the adjoining room, and the light is easterly. The third studio has northerly lighting, and in this there is an arrangement for darkening the room in a few seconds. Sitters are always pleased to see their portraits life-size, and, by the aid of this darkening arrangement and a solar camera let into the wall, they may be at once gratified in this respect. From the circumstance that the Mayall establishment produces a large number of enlargements, we may well presume that this ingenious contrivance is not without some influence upon visitors.

Of lenses Mr. Mayall has a battery—or shall we say a park?—for the huge instruments remind one very much of artillery, their calibre is so big. The condenser of the solar camera measures no less than 24 inches. Here is a triplet of Dallmeyer's; it is eighteen inches in length, and six inches in diameter. Next to it lies a shining instrument of Voigtländer, with a calibre of no less than nine inches, together with another of seven, and a monster by Ross that actually measures ten inches across. This last magnificent instrument has upon the face of it markings like drops of water; they are the effects of a heavy hammer wielded by one who, in a temporary fit of madness, essayed to demolish this lens out of sheer wantonness. How well the hard glass resisted the ill-treatment is really marvellous, and, strange to say, the markings have no effect upon the lens as an optical instrument.

There are few curtains and screens in the studios. The curtains above are of blue linen simply stretched upon wires three feet apart, the curtains being brought over, or pulled back, by means of a pole—a simple and effective arrangement that never gets out of order. There are some bits of tapestry for employment as backgrounds, but the most striking of these was one of Mr. Whaite's own invention. It rose some eight feet high, and was constructed of jointed or ribbed wood, or, more properly speaking, of laths standing upright. It could thus be made to assume various forms—a semi-circle round the model, a recess, and consequently shadow, to his left or right, or, if necessary, a column might be shaped at one side by bending the plastic screen suitably. The covering of this background was of grey cloth, which, naturally enough, was rendered dark or light according as it was put into the shade or not.

The terms at Mr. Mayall's establishment are not high, for Brighton is a cosmopolitan town, and all tastes have to be satisfied. A dozen cartes are charged fifteen shillings, and eighteen one guinea, while for a group of two, half as much again is demanded. For a guinea you have six cabinets, and twelve for a guinea and a half.

The next "At Home" will be "The New Autotype Gallery in Oxford Street."

NOTES ON GELATINE EMULSION.

BY M. BASCHER.*

1. In working with gelatine one can and ought to have more light than is generally used. First we must see what we are doing; the result depends upon it. Fogginess does not occur so much as is supposed from excess of light in the darkroom. The most important thing to be observed is that the light be of a certain colour, either deep red or brilliant orange.

2. In order to obtain a good emulsion easy to develop, the quantity of bromide of silver ought to be two-thirds that of the gelatine, and for the facility of manipulation the best proportion of the bromide to the silver should be that of 8 to 12.

3. In the manufacture of emulsion sufficient importance is not attached to the kind of bromide employed. All the bromides do not produce the same effect. The most rapid and the best seems to be that of ammonium; but, employed alone, it occasionally gives thin or grey proofs. Bromide of zinc shows exactly contrary qualities. Bromide of lithium has the property of strengthening the film and making it adhere well to the glass.

4. By increasing the amount of silver in the emulsion the rapidity is augmented, an effect also produced, as Mr. Bennett has remarked, by leaving it longer in the water-bath, a week even, for its decomposition can be delayed or stopped, according to Dr. Monckhoven, by adding ammonia. As, however, this addition may cause the bromide of silver to precipitate, the ammonia must be employed sparingly and with great care; one or two grammes of ammonia being generally sufficient for one hundred grammes of emulsion.

5. During the winter it is desirable to warm the plates while coating them with gelatine. In spreading the emulsion with the glass rod, the plate may be held by the pneumatic holder in the left hand, or placed upon a perfectly horizontal table. The dexterity necessary for obtaining an even film is very easy to acquire.

6. Once covered with gelatine, the plate must rest some moments in a horizontal position, and in an open place, that the gelatine may solidify.

7. In order to dry the plates, we can either put them into a cupboard, or simply expose them in a room resting upon shelves; but in either case it is necessary that a light current of air should pass over them, and that they are preserved from dust and light.

8. A gentle heat may be used in winter-time, but always in a uniform degree. By afterwards soaking the plates in alcohol they will dry more quickly, but accidents sometimes happen.

9. The substratum of albumen treated with chrome alum is the best means of preventing the film from frilling. It has also the advantage of not delaying the development. If, however, through too great a heat, or at the time of development or washing, there is a tendency to frill, recourse must be had to a concentrated solution of alum, to be applied before fixing. The alum may also be put in the hyposulphite, but it is preferable to let it be used alone. In the case of frilling during the development—fortunately a rare occurrence—all the plates of the same series should be plunged into the chrome alum bath ($1\frac{1}{2}$ per cent. solution) before continuing the process. This operation certainly delays the action of development, but not so much as is commonly supposed.

10. Another inconvenience, which does not apply solely to gelatine, occasionally occurs: this is the effect of solarization. A good emulsion—Dr. Monckhoven's, for instance—scarcely ever shows it.

The following are the best remedies against solarization. Avoid, as much as possible, too great contrasts in the image to be produced; place the camera so that no reflection of light can penetrate the objective; do not prolong the exposure more than necessary; and, above all, stop the development as soon as possible, or, still better, blacken the interior of the dark-slide, and even the back of the plate.

* From the *Moniteur de la Photographie.*

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."

No. 7.—A House Warming.

This negative was taken about seven years ago. It is a square-built house of three storeys, with a garden in front. It is a half-plate, and was taken with a stereoscopic lens, which accounts for the fuzziness of the corners, and the

earthquake and fall-down appearance of the gables and chimneys. The lines on this negative would drive an architect mad: there is not a parallel one, either horizontal or perpendicular. With the exception of these little oddities, there is not much to remark about the negative, except, perhaps, that it was the first dry plate that ever I worked. I was engaged at the time in taking a set of pictures of Scottish scenery, and was working round Loch Fadd in the Island of Rothsay, intent upon finishing up the day's work with a picture of Kean's Cottage, when I was accosted by a little gentleman with a red face, red hair, a turned-up nose, and a most unmistakable Irish brogue. His first remarks were not very original. The weather was discussed, and photography described as a most "wunderful owrt," and he finished up by expressing an earnest wish to know how I did it.

I daresay that every brother operator must at some period or other have had his breath taken away by the above simple and innocent question. It was only the other day that a grinning young farmer, with rosy cheeks, thundered in upon me, and, to my civil questions and remarks, only deigned to blush and grin and nod. Now I flatter myself that I have a nice wheedling tongue at putting my sitters at ease and bringing them out, so to speak; so I set to work upon the farmer. I grinned back at him—I spoke upon the weather—the crops—the last flower show—made a pun, and cracked a joke, but all my powers fell short; he would do nothing but blush and grin and nod his head. When within the sanctity of the dark room, I pondered over the silence of this automatic sitter, and came to the conclusion that he must be dumb. However, as a last resource to find out if such was the case, I resolved, against my general rule, to show him the negative. This I did, and the miracle worked—the dumb spoke! "Lor!" he exclaimed, as he bestowed upon me a look of mingled awe and delight: "How do you do it?" I explained to him that his was a natural and simple question, and that it would only take me about five years to fully answer it.

After the little Irishman had his inquisitiveness fully satisfied—how long I had been at the business, where I had come from, and sundry other little inquiries of a like nature—he in turn became communicative; but before he started, he thrust his thumbs into the arm-holes of his ample waiscoat, and, laying his head on one side, looked at me with his eyes (light blue they were) in such a manner as to plainly infer, "I'm going to give you a poser," exclaimed, "Now, me bhoy! What countryman de ye think I am?" I answered at once that he was an Irishman. "Bedad! yer the first that's guessed id! Most people take me for a Frinchman! But yer right—my name's O'Rourke—one of the most anshant names in Oirland. We were kings of Caunaught onct, but, botheration! it's uo use talking of them—I've troubles enough of my own without fighting for the rights of me noble ancestors. Troubles! I should think I've troubles. Bad luck to the day I was born on, say I, for it brought bad luck to me! I am now an exile from me native land, and through that same day I was born upon, me younger brother tried to cheat me out of my fortune!"

"I really don't know what you mean, Mr. O'Rourke?"

"Bedad, then, I'll soon explain it. I was born in Leap Year—devil leap it!—on the 29th February, so that I have only a birthday onct in four years. When I came of age me brother took the law of me, and argued that he was the legal claimant of the property—that he would be of age before me, his elder brother, the spalpeen! Ye needn't laugh. They said that as I had had only five birthdays, I was only five years old, and should be sint to school. The blood of the O'Rourkes could not stand that, so I sint a challenge to my brother, and the judge, and the lawyer, and commenced practising with my hair-triggers. Bad scran to the cowardly houuds! if they did not inform the police, an'I had to fly the country."

The upshot of all this was that the O'Rourke had settled at Rothesay, and, liking the company he found there, he had built a new house along the Ardbeg Road. It was hardly finished, but as next day happened to be the 29th of February—for it was Leap Year—he had resolved to call together a few genial souls, and have a proper house-warming as well as keep his birthday.

"An, me bhoy! ye'll come an photograph it! Ye'll come to-morrow," he coutinued, in great glee. "An, by all the saints in the calendar, if you don't get y'r skin full of pure ould Irish, an'yer belly made as tight as a drum with good mate, theres no truth or honesty left in the O'Rourke!"

I had not had a holiday for over six months, and as the O'Rourke's offer promised plenty of fun, I instantly closed with him. It was stereoscopic pictures that I was working, and, having no other lens with me, I was fain to try it—stopping it well down—but with the miserable result I have described. I had had a packet of the Liverpool Company's dry plates sent me to try any time at my leisure, and I thought this a very fair opportunity. So behold me next day with my half-plate camera—the division having been taken out, and one of the lenses fastened in the centre—all ready to commence. One of the rooms was darkened on purpose for me to change my plates, for I had resolved to only change them, leaving the developing until I could do it at my leisure within my dark-tent. Six plates I exposed with varying exposures—five, six, seven, and even ten minutes—every one knows how slow in action were the first dry plates. I changed the exposed for the unexposed in my little box, while the O'Rourke stood at my elbow, and strained his blue eyes in the dark to make out what I was doing. By good luck I left the last plate in the dark slide.

At length, as the day wore on, the company arrived. There were three Irishmen with great green sprigs in their button-holes, and six or seven pauky Scotchmen with red noses, and abnormally developed thirsts; and a long-haired, pale, uninteresting youth, whom the O'Rourke introduced as "a borned singer, whose vice might tempt the angels out av Heaven." I am not going to give you a detailed account of that dinner—most readers can imagine what it was like.

After dinner we adjourned to the kitchen, where whisky-drinking and house-warming commenced in earnest. There was an immense fire, and the cook was retained in the room solely to keep it up. Songs and tobacco were now the fashion: the young gent with the long hair and pale face distinguished himself in the former, and I awoke admiration at the latter. At length the heat and the whiskey, the tobacco and the roaring of choruses, began to tell on us. The first to disappear was the young gent with the long hair. Then—then, I rather think it was my turn. There was a large table at the far end of the room, and at grey daylight I found myself lying under it, while strange cries were heard proceeding from the vicinity of the still smouldering fire. No one was awake but myself and the party making the strange noises. To stir up the fire, to find an overturned candle, and get a light, was *not* the work of a moment, as novelists say; but when I did get it, I found that the cries proceeded from the young man with the long hair. For the life of me I could not help laughing. He had slid off his chair near the fire, and, overcome with sleep, had laid his head against the still wet plaster. The consequence was obvious; his head was now imbedded in it—so much so, that we had to pick him out with our pocket knives.

Next morning I tried to develop my plates—first one, and then another. Failure after failure—nothing but fog. What on earth could it mean? While I was puzzling myself over the singularity of the thing, and suspiciously regarding my developer, the cheery voice of the O'Rourke saluted me: "I hope my taking a peep at thim bits o' glass has not done thim any harm?"

Here was a solution! Unable to repress his curiosity, the O'Rourke had slipped into the room, and had a good look at my undeveloped plates.

Thank goodness! there was one in the dark slide, and it was all right—right that it pleased the O'Rourke, although it did not give straight lines.

The Photographic News.

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THE DEVELOPING OF GELATINO-BROMIDE PLATES.

Regarding few points of photographic practice do we meet with such various and, among the most extreme novices, such dogmatically-expresed opinions as we frequently hear expressed regarding the development and subsequent treatment of gelatino-bromide plates.

The tendency among those who have had but little experience is almost always to speak with extreme confidence, and to seek every opportunity of proclaiming their hastily-formed and crude opinions from the house-top and at the street corner.

A man who has prepared a few batches of plates—the conditions of preparation being, perhaps, very similar in each case—is much more confident as to what can be done with gelatine, than the worker who has experimentally followed the gradual unfolding of the process from its inception up to the present time.

We find, then, that Mr. A. is convinced that the only way to obtain a truly artistic negative is to develop it with extreme slowness, and he rolls his eyes, or gently waves his hands, while he expatiates on the "gradual appearance of each successive gradation of tone," the "full and highly modelled half-tones in the higher lights of the subjects," and the "depth of detail diffused through the darkest shadows of the picture." On turning round to Mr. B., we are told that his experience is quite contrary to that of Mr. A., and that the only satisfactory way of getting a good negative is to give the correct exposure, and pour on a suitable developer at once—making, in fact, only one shot at it; and standing or falling by the result. Mr. C. is perfectly sure that every gelatine negative can be intensified to any desired extent with the greatest ease and certainty; while Mr. D. contends that with some kinds of plate, intensification is impracticable. Mr. E. cannot possibly understand how anyone can be so foolish as to entertain for a moment such an absurd notion as to fix a gelatino-bromide plate in cyanide, as in his hands this reagent not only causes the image to disappear immediately, but produces frilling of the film in an aggravated form.

The above-mentioned differences of opinion, and many others also, are easily traceable to two circumstances. In the first place, Messrs. A., B., C., D., and E. work under very different conditions; and in the second place, humanity has a very unfortunate tendency toward over-hasty generalisation. The gelatino-bromide plate is too often regarded as a constant factor rather than a variable quantity. As a standard developing fluid calculated to yield a satisfactory result with the average bulk of gelatino-bromide plates, the following may be taken. In the first place, a developer consisting of three grains of pyrogallic and an ounce of water; and in the second place, an acc lerator containing six minims of strong liquid ammonia, and one grain of potassium bromide, to each ounce are prepared. These two solutions mixed in equal portions form a developing fluid which in many or, perhaps, rather, in most, cases will give a satisfactory result. Let us suppose that we are working with plates fitted for the above-mentioned developer, and that the most suitable exposure has been given. The two solutions having been mixed and poured directly on the dry gelatine film, the first signs of development become visible almost immediately, and in a very few seconds the image is fully out, only a very few point of the plate showing the light colour of silver bromide by reflected light. The variations to be made as regards the relative proportions of developer and accelerater when under-exposure or over-exposure is known to have been given, are sufficiently understood by all gelatino-bromide workers, and this point need not, therefore, be discussed at present; but the question as to the circumstances which render a rapid development or a slow development may be desirable is less perfectly understood, and deserves especial study. In order to throw some light on this matter, we made a few experiments which we will now proceed to describe.

Some plates were prepared, and were found to be capable of yielding satisfactory results either by quick or by slow development. Two of these were exposed under exactly similar conditions, the subject being the interior of a room; but as the camera was directed to that portion of the apartment opposite to the window, no extremely violent contrasts of light and shade were included in the field of view. One of the plates was brought out by means of the standard developer above mentioned, the gelatine film not being moistened previously, and the development was completed in two minutes. The other plate was soaked in water for one minute, after which the same kind of developer, but diluted with ten times its volume of water, was poured on. In five minutes' time very little of the image was visible, so the developer was replaced by some of the original strong developer diluted with five times its bulk of water. In ten minutes' time the image did not appear to have become much more intense, so the solution was replaced by some of the original, diluted with an equal bulk of water. This was allowed to act for ten minutes, after which some of the undiluted developer was made use of, and this remained on the plate for five minutes. Both plates were now fixed and examined. As regards general qualities, vigour, gradation of tone, and delicacy of modelling, they were so far equal that no preference could be given to either; but that plate which had been subjected to the action of the developer during half an hour was slightly stained by a brown tinge, whereas the plate which had been developed quickly was perfectly free from anything of the kind. In this case, then, there was no advantage in developing slowly.

The camera was next turned round and directed towards the window. Two plates similar to the first being now exposed, one was developed with the developer of full strength; and, in two minutes and a half, a negative was obtained which showed signs of the reversed action of light in the sky, and at the same time failed to properly delineate those objects which were situated in the shade immediately under the window. The twin plate to this was developed slowly, the operation being commenced with a ten-fold diluted developer, and carried on much in the same way as the slow development detailed above, only it lasted five minutes longer, making thirty-five minutes in all. The resulting negative obtained was altogether different from the quickly developed one, no trace of the reversed action of light being visible, and all the details of the deepest shadows were fully and well brought out, while the whole appearance of this negative contrasted most favourably with the corresponding one obtained by rapid development.

These results indicate that a rapid development may be suitable in the case of subjects presenting no great extremes of contrast—as, for example, in the case of studio work; while those subjects which include the greatest extreme of light and shade are more faithfully rendered by a slow development.

GELATINE FILMS AS A SUBSTITUTE FOR GLASS.

We have been experimenting in the direction recently indicated by the Rev. H. J. Palmer, in a paper read by him at the Liverpool Amateur Photographic Association.* The gelatine films prepared by his method appear, indeed, so promising that, once they are at hand, there is plenty of incentive to continue the investigation. Mr. Palmer holds that the proper support for gelatine emulsion is gelatine, and so it may prove to be when we have learnt something more respecting it; but at present we must frankly own that we find glass a still better basis. Mr. Palmer prepares his gelatine films in this way. Thirty grains of gelatine are dissolved in four drachms of water, and to this is added two drachms of oxgall and two drachms of methylated spirit. This is carefully poured upon a glass plate, so that the latter is covered throughout, and, after draining, the gelatine is allowed to set upon a levelling stand. When dry, another solution of gelatine, made up of—

Gelatine	30 grains
Water	6 drachms
Alcohol	2 ,,

is applied. The drying is done on a levelling stand, and all bubbles removed with care. This dry film is now coated with emulsion. The emulsion contains, according to Mr. Palmer's recommendation, two drachms of alcohol for every six drachms of water, the spirit, we presume, being added to assist in the drying, and to make the emulsion flow smoothly.

We have prepared dry gelatine films in this way, or, at any rate, following the directions of Mr. Palmer as closely as we could, and we have also employed sheet gelatine, such as is employed for bonbon crackers, only a little thicker, treated with chrome alum to render it insoluble, and backed with collodion. Of the two classes of film we preferred that of Mr. Palmer, but his pellicles took a long time to prepare. As a makeshift, both classes of film may be used with tolerable success, but, as we said before, neither gelatine film in our hands could compare with glass. Not one fault, but many, we have to find with them; but two principal defects it will here suffice to mention.

In the first place, treat gelatine how you like—unless, perhaps, it has been impregnated with a bichromate solution, and exposed to light through and through—it still retains its disposition to absorb moisture. You can make it as tough as leather, and render it wholly insoluble, but it still attracts moisture from a damp atmosphere; and unless mixed with glycerine, sugar, or some such substance, it gets brittle and chippy, if subjected to a drying influence. The films, therefore, in very damp or very dry localities, become untrustworthy.

The second charge we have to make against the films is that they appear to rob the emulsion poured upon them of some of its sensitiveness. The same emulsion upon glass was more rapid in its action than when employed upon films of gelatine.

Still we must give Mr. Palmer credit for having certainly advanced a step, and made some progress towards the solution of a problem which has been a stumbling-block to the photographer for many years past. We hope he will still persevere, although his results may not so far have given altogether perfect results. The importance of a film of this kind as a substitute for glass is so great that for some time past the Vienna Photographic Society have offered a gold medal to any one who can produce such a material, while only the other day, under the auspices of the French Photographic Society, a prize of five hundred francs was offered for the same desideratum.

* See Photographic News, page 315.

Notes.

Dr. Huggins showed some more of his interesting photographs of star spectra at the Royal Society recently. These pictures are likely to tell us more of the composition of the stars than any previous observations made by other means. Dr. Huggins has, he tells us, been able materially to improve his camera and spectrum arrangements. From the last photographs taken, certain stars, such as Vega, give a complete spectrum of hydrogen, while others, more yellow in colour, show less of these lines. A third class gives a complex spectrum like that of the sun.

A generation has now passed since photography came into general use. One can hardly say that camera pictures were common household treasures before 1850, and an era has set in which may be fitly termed an era of regrets. We find, it is true, that photographs fade, but not so quickly, alas! as the friends and acquaintances they represent. Grown-up men and women look curiously at their baby photographs, and grandfather and grandmother turn back with trembling hands the first page of the album to see themselves once more in wedding garments, and to muse on the times of years ago. More tender still are the thoughts called up by the pictures of those that are no more; the bright clever youth who here stands before us, so full of life and energy—the radiant maiden, her warm lips and sunshine smile apparent still in the little brown picture—have left behind them no personal sign that they once were, save and except these shadows.

After a while we shall grow accustomed to the hard truths the camera teaches us, but the present generation is the first to appreciate them to the full. That life is but a span is illustrated in every family album in the kingdom, and the adage was never so vividly and frequently brought home to us as in these days of photography. At first the album was a novelty, an ornament, or at most a subject of interest; then it passed into the phase of collections, and one gathered together series of portraits of this friend, or that, in ball attire, walking dress, or fancy costume. But now albums are becoming sacred, and owners jealously guard the yellowest and most faded of their stock. A lock and key is fitted to the book, and it is treated with a reverence that day by day becomes more marked.

Says a correspondent:—"I have found a very good and simple specific against frilling in one of the old Year-Books. It consists merely in running a tallow candle round the gelatine plate, so as to make a fatty margin an eighth of an inch broad. Any frilling, at the edges, at any rate, is thereby avoided."

Another writes:—"I have just lost two very good negatives by reason of the hot weather. The films were placed to dry upon a shelf, like collodion negatives, and the warm air caused the gelatine to run. In five minutes there was nothing left of them but a few dirty streaks. Others may profit by my experience."

The Municipal Council of Paris has intimated a desire to present the London Corporation with a large album of photographs representing ancient Paris. Our own city magnates would do well to imitate the example of their Paris brethren, and secure a collection of pictures of old London. Hitherto, the depiction of interesting objects of this nature has been left to relic-loving photographers.

There are several localities we could point out—they are few and far between now-a-days—the depiction of which, by means of the camera, would afford interesting records worthy of a place in the city archives. It is surprising how few are the maps and plans, let alone pictures, that exist of London in the olden time, and these are so imperfect that a lively discussion lately arose as to whether some animals in the water, in an old engraving representing the Thames near Westminster, were cattle drinking or horses employed as water-carriers. The question is still a moot point, but the picture is taken as proof of the purity of Thames water at the time.

Now that there is no difficulty in producing permanent photographs, we think the City might bestir itself and secure the shadows of some of the old buildings that are fading in our midst. The Tabard Inn in Southwark has gone, and so, too, has the old playhouse of Shakespeare's time in Playhouse Yard. Middle Row, in Holborn, is no more, but there still exists at Holborn Bars a row of peak-roofed, over-hanging dwellings, that call up the days of Dick Whittington. In Wych Street another bit of old London is to be seen; while down by the river at Wapping and Shadwell are still to be found examples of the waterside taverns, their many-paned windows and wooden balconies, propped on crutches in their old age, which are intimately connected with the history of press-gangs and with the days of our old three-deckers, before even Nelson and Collingwood were familiar names in the navy. There are subjects here enough to fill a large album, and it is really surprising that a matter of such interest should so long have been neglected.

As to developing in daylight, we may frankly say that we have not succeeded to our satisfaction. Our first experiment was made in conjunction with Mr. Swan, and since then we have repeated it a dozen times, and never yet secured the same clear result that development in a dark room gives. Our plan is always to cut the plate in halves, and then to compare the result of developing in daylight with that developed under ordinary circumstances. Unless you make this comparison at the end you cannot judge properly how far success has attended your efforts.

Very often we have been able to get an apparently good negative by flowing the negative in the dark room, and finishing the development in the light of an ordinary room; but on comparing the two halves subsequently, the advantage was always in favour of the dark-room plate. At the same time, it is very certain that when the image has once begun to appear, you need not be so chary about admitting light, and a screen of yellow glass or tammy offers, in nine cases out of ten, sufficient obstruction to actinic rays.

Topics of the Day.

ON THE LIME TONING BATH, ETC.

BY VALENTINE BLANCHARD.

The object of the present paper is to describe the best method known to myself for producing the rich warm brown tones in silver printing on albumenized paper. I will do my best in this matter, but I would like also, *en passant*, to dwell on some other points connected with silver printing, which I hope may prove interesting to others besides myself.

The first and most important question of all is, that of permanency; and here I shall at once start with queries I have often put to myself. Why is that experiments frequently performed in a hurry, and when, in consequence, no attention has been given to careful washing, have often yielded results much more permanent than those produced in the ordinary way, "with all appliances and means to boot?" And why, as a rule, are the productions of an amateur much more durable than those of the professional photographer? I think the answer is to be found in the fact that in both cases a small number of prints are immersed in a large quantity of fresh hypo.

Every one who has observed closely must have noticed that the first prints placed in the hypo bath are in it some time before the red tint, observable immediately after immersion, gives place to the purple brown which afterwards comes; but after a time, when more prints are introduced, the tone desired comes more readily. It is not my intention to deal with the chemistry of the question. It may be that hyposulphite of soda, an unstable salt, ready to part with its sulphur on the slightest provocation, rapidly loses its power to re-dissolve the hyposulphite of silver formed on the first immersion of the print, and so instead—and in order to show its diabolical origin—deals out sulphur through the length and breadth of the print.

Some short time since I spent an evening with one of the first Council of the Photographic Society, Mr. Hugh Owen, when he showed an album, and also a large number of unmounted prints, made about 1851; and they were all as fresh, apparently, as on the day they were made. He accounts for the freshness of the prints thus. He fixed every two or three prints in fresh hypo, and washed each print separately on a large sheet of glass, using a large sponge, and by its aid making the print nearly dry before immersing it in fresh water. But the most important point of all, in his estimation, was the fact that he employed distilled water for washing. I am inclined to think, however, that the employment of fresh hypo, and the separate washing, have tended more than any other cause to the really marvellous degree of permanence exhibited by these prints.

I will now proceed to describe the method I have employed to produce the large prints exhibited by me from time to time in the photographic exhibitions. I do this at the request of the Editor, who is constantly asked how to produce rich warm-toned prints. I fear there will not be much in my method new to the majority of the readers of this journal, but at any rate it will be an exact description of a plan that has never failed me during many years, and may be interesting to some on that account. To begin, then:—Take half-a-pound of chloride of lime (the common disinfectant, to be procured at any oil-shop) and shake up in a bottle with (say) a pint of water; but the quantity is quite unimportant, for the object is simply to saturate the water with chloride. Allow it to settle, and then filter. When the solution is quite clear, store it away in a well-stoppered bottle. This solution will keep almost indefinitely, for it parts with the chlorine very slowly. Now, to make the toning bath, allow one grain of gold to each sheet

of paper. Take, therefore, from stock-bottle of gold* as many ounces of gold solution as are needed to tone the batch for the day. Pour into a jug, and add a piece of common whiting about the size of a nut. Stir well with a glass rod, and pour on enough boiling water to make about eight ounces of water for each grain of gold. It may be made stronger if necessary, but it will not be found so manageable in unskilled hands. Put it aside an hour to settle. When ready for toning, pour off the clear portion into the toning dish, and add one drop of lime solution to each grain of gold—not more. It is almost impossible to add too little; but if too much be added, the prints will bleach considerably during the toning. The object of the whiting is to neutralize the acid present in gold solution, and indicated by its yellow colour. It will be found that after the addition of the hot water the solution loses its colour, and becomes perfectly white. If used at once—that is to say, as soon as it has cooled—the solution would tone without the addition of the lime solution; but if used many hours after making, it will be found that the solution frequently refuses to tone at all. The reason for this is to be found in the fact that gold is very quickly precipitated from a neutral solution of chloride of gold. I prefer to add the lime solution a very short time before beginning toning operations, but I think in general practice it will be better, immediately after adding the hot water, to drop in the lime solution, and stir all together, and then let settle until required for use. Never exceed one drop of lime solution to each grain of gold.

The prints are washed in several changes of water in the usual way, and are then immersed in the toning bath, and moved well about, taking care to avoid air-bubbles. Do not wait until the red tint gives place to purple, or the print will be toned too much. Remove to a dish of water the moment the colour has changed to a warm brown. If in doubt about colour, take another print waiting to be toned, immerse it for a second, and then compare. You will then see how far the toning has gone.

When all the prints are toned they are ready for the hypo, but it is well to change the water several times if there is a large batch of pictures, or, better still, put in a pinch of common salt, otherwise the toning frequently goes on even after the placing in the water. In passing the prints into the hypo, be careful to lift them with one hand, and push under the hypo solution with the other, for if the hand with hypo on it be carried to the dish containing the prints, a yellow stain will form on their surface. I do not think it well to use the hypo too strong; I formerly advocated one to four, and a shorter immersion. I now think one pound of hypo to six pints of water strong enough; with a paper of medium thickness from seven to ten minutes is long enough. It is most important to move the prints well about in the hypo. I like to have two hypo baths for each lot of prints, and after well turning them over in the first bath carry them on to the second, again turning them well over. Use plenty of hypo, and do not fix too many prints at once. Rive paper much more readily takes a rich brown tone than the Saxe.

I do not like prolonged soaking in water. If in washing the prints they are well drained in passing from one dish to the other, and this operation be continued steadily for an hour, I feel sure the hypo will be more perfectly extracted than when they are allowed to remain all night under a running tap.

The "Topic" for next week will be "With the Camera in the Isle of Wight," by John Spiller, F.C.S.

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* I dissolve each grain of gold in one ounce of water, so that every ounce of gold solution represents one grain of gold.

Reviews.

The Practical Working of the Gelatine Emulsion Process. By Captain W. de W. Abney, R.E., F.R.S. (*London: Piper and Carter, 5, Castle Street, Holborn.*)

Captain Abney says, in his Preface to this "Handy-book," that "every process and manipulation has been practically carried out by the author, and nothing has been taken on trust," a sentiment that all photographers, be they professional or amateur, will know how to appreciate; and to this we may add another fact that cannot but enhance the value of the publication: it is brief, concise, and to the point. The whole process is placed clearly before the reader, from preparing the emulsion down to the final fixing and varnishing of the film. Nay, more, Captain Abney tells us something about precautions to be taken before the photographer can hope to work surely and well with these highly sensitive films, to which the practice of the wet process is but an imperfect apprenticeship. Thus, on the subject of testing the camera and dark slide, he says:—

"Before attempting to work gelatino-bromide plates, the camera should be rigidly examined. The aperture in which the lens screws should be blocked up, and the ground glass raised or withdrawn. A cloth should then be placed over the back, but not over the bellows, and any small pinhole searched for. If any be found, a little black paper should be pasted over it, and varnished with lampblack in shellac. With a new camera by a good maker this is not likely to occur, but, at all events, it is a wise precaution to take. The next apparatus examined should be the dark slides; and here particular care must be taken. The best plan is to place sensitive gelatine plates in them, and expose both back, front, sides, and ends of the shut slides to direct sunlight, if possible. The plates should then be treated as if exposed, and the developing solution applied. It is very probable that lines may be found across the plate where the front of the slide is hinged and turns back. It seems in this case almost as if light travelled round corners, but it is, in reality, the reflection—or, rather, the re-reflection—of the light striking the inside of the rebate, and so falling on the plate. If a line does make its appearance, a little lampblack in gelatine should be applied to darken the surfaces of the wood where the front hinges, and this will generally stop all mischief. It must be recollected, however, that a slide containing gelatine plates should be exposed as little as possible to daylight, but should always be covered with a dark cloth."

Again, on the subject of exposures, Captain Abney gives words of warning which ought to be scrupulously attended to by gelatine workers:—

"*Regarding Exposures*, but little has to be said; those who have been accustomed to work wet plates should judge what exposure they would give when so doing, and should then divide the time necessary by the constant denoting the rapidity of the plates. Some photographers, when working with ordinary dry or wet plates, are accustomed to put their own caps on the lens or in front of it whilst, perhaps, there is movement amongst foliage. This will not do for gelatine plates; the cap of the lens, or its equivalent, must be absolutely replaced, or the light reflected will fog the plates. The very illumination of the glass of the lenses will often cause fog, if the exposure be prolonged and any portion of the subject be brilliantly illuminated. The use of stops much modifies the mischief. This is a rare defect, however, and need scarcely be entered into, except as showing how an evil can arise."

A chapter on "Failures and their Remedies" is not omitted from this useful little book, while, what is very important just now, "Precautions to be taken in Hot Weather" also finds a prominent place in the volume.

The final words in the Introduction should be borne in mind by those—and there are many at this season of the

year—who travel with camera and dry plates through the land for business or pleasure, or both. Captain Abney says:—"Above all things, the slides should be capable of being locked up. Curious chamber-maids and hotel porters are thus placed at a disadvantage to themselves, but the reverse to the photographer."

FRENCH CORRESPONDENCE.

Another Process for Inverting Negatives—Manufacture in France of Photographic Paper—Some more French Patents.

Process by M. E. Isard for the Inversion of Gelatine Negatives.—In my last letter I gave an account of M. Chardon's new method of inverting negatives, which, it may be remembered, consisted in interposing a film of collodion between the glass plate and the layer of gelatine. Previous to this, I described the process published by M. Arentz, in which he employs a layer of caoutchouc coated with a layer of non-sensitive collodion. This last method is a very good one for transferring pellicles of collodion, but, according to M. Isard, it does not succeed properly in the case of gelatine films. M. Isard has himself devised a method which, while differing very slightly from that of M. Arentz, enables him to transfer successfully films of gelatine. His method consists in making two layers of caoutchouc dissolved in benzine; when the first of these layers is dry, he interposes a film of ordinary collodion containing about 1·5 per cent. of pyroxyline, and covers it with the second layer of caoutchouc, this latter being itself again coated with a film of ordinary collodion. When this is finished, strips of the peculiar black paper called *papier à aiguilles* are glued all round the plate, so as to form a frame of the required dimensions, and the whole is then allowed to become thoroughly dry. If now it be desired to at once transfer the negative, it is only necessary to cut through the layer along the outer edge of the paper frame, and by raising one of the corners of the pellicle with the point of a knife, the whole may be stripped off in one continuous movement. Provided care has been taken to let the paper get perfectly dry, the pellicle is sure to come off without its dimensions being in any way distorted. It will be seen that by nearly all similar processes we are enabled to get films which are so thin that we can by inverting print on either side. We can, therefore, in case of necessity, prepare for the inversion, while leaving the pellicle adherent to the glass plate on which a negative image has been taken; and when we wish to invert the negative, we have only to cut through the edges of the film as above described, and to strip it off the plate.

New Papers for Photographic Purposes.—Up to the present the paper mill at Rives have had, so to say, a monopoly in France of the manufacture of papers intended for photographic use. Recently, however, the proprietors of some new works established at Renage (Isère), not far from Rives, have turned their attention to this speciality. They have not only undertaken the manufacture of paper specially designed for the use of photographers, but they themselves prepare albumenised paper fitted for immediate use. Hitherto the photographer has had to coat and hot-press this paper himself, according as he requires it for silver chloride printing, or for the Woodbury process. The practice pursued in most of our photographic studios up to the present has been to take the paper as it arrives from the Rives factories, to size it with gum-lac, and then to hot-press it. The cost and trouble of thus preparing the paper, increased by the necessity of always having at hand a steam press of great power, have been among the principal causes why so many photographers have not taken up the Woodbury process to a greater extent. Now, however, that Mr. Woodbury has succeeded in greatly simplifying and improving the machinery of his process—as I have pointed out in previous correspondence—the only obstacle to its coming into general use is the preparation of the paper. This obstacle will now therefore also be overcome; the owners of the paper mills at Renage undertake not only the manufacture of the special kind of paper required for the process, but also to deliver it in a finished state, sized and hot-pressed. Studios of the smallest means will be in a position henceforward to work the Woodburytype process. Another great advantage is that the price of this paper, of the best quality, is so low that even those who have the necessary machinery for preparing it will derive no profit from doing so. If I recollect rightly, the price quoted is only eighty francs the ream. On the best authority I am able to assure my readers that the makers at Renage will neglect nothing to develop to the utmost extent the manufacture of special photographic papers; this is a point which interests not only French photographers, but those also of all other countries.

New French Patents for Improvements in Photography.—During the holidays photographic news is few and far between; I take the opportunity, therefore, to continue the list of patents lately taken out in France. The small space devoted to this letter only allows me to give a mere transcript, but should any of the readers of the Photographic News desire to have more complete details of any of the patents enumerated, I am quite at their service to procure further information. No. 135,847, 30th March, 1880 (Winter and Co.)—For photography on woven stuffs, specially prepared for the purpose, and for the process of taking the photographs. No. 136,032, 9th April, 1880 (Dutkiewicz and Decouflé.)—For a process of painting photographs on linen, called *Linéographie.* No. 136,077, 12th April, 1880 (Fabre).—A new method of applying colours in photography. (I have already given an account of this process.) No. 136,043, 15th April, 1880 (Dupays).—For the preparation of paper, woven fabrics, and panels for general photography. No. 136,253, 21st April, 1880 (Bell.)—An improved method of photography from nature, applicable principally to engravings, lithographs, &c.

Leon Vidal.

CHANGES IN PHOTOGRAPHIC PAPER AND CARDBOARD ON EXPOSURE TO LIGHT.

BY DR. H. W. VOGEL.*

At one of the recent meetings of the Berlin Association for the Promotion of Photography Herr Münch exhibited a specimen of a new kind of rose-coloured albumenised paper, which possesses the advantage, over papers that have hitherto been produced of not fading by exposure to light. It is a well-known fact that the pink albumenised paper is so much liked—at least, in Germany and Austria—that a sheet of the white albumenised paper is seldom asked for, and then only when it is wanted for a photograph on which it is intended to paint. Unfortunately, however, it is also a fact, that the pink colour very soon, under the influence of light, changes to an unpleasant grey. To try the experiment, I took a piece of common rose-coloured albumenised paper, shaded the half of it from light, and placed it in the window; in twenty-four hours the colour of the uncovered half had disappeared. A piece of Herr Münch's new paper, treated in the same way, had suffered no alteration, even at the end of four days. The colouring material of this new paper is not yet made public; that of the old paper, as may be proved by experiment, is fuchsine. How quickly this substance fades under the action of light is best seen by exposing a sheet of paper deeply coloured with fuchsine under a negative; in the course of twenty-four or forty-eight hours a negative copy of the same will be obtained. But, unfortunately, all the aniline colours are also liable to fade under similar circumstances. When the pigmented positives were so much the fashion, many photographers used to cover their productions with glass plates stained with violet or rose-coloured varnish, but, as is well known, these plates

* *Photographische Notizen.*

did not long keep their colour. I have in my possession several such varnished plates, on which have been taken by the action of light good positive copies of the transparent positives covering them. Now this liability to fade characterises not only the varnished glass plates, but also the pigmented pictures themselves, for these, as we know, when hung in the window, soon lose their warm violet tint, and appear cold and grey. Two years ago Van Monckhoven pointed this out. Even collotypes, which have been produced in fatty inks, with a tint to resemble photographs, and which are now so commonly met with, are subject to this fading; collotype printers are therefore urgently recommended to use only a permanent pink pigment in this ink.

Unfortunately, not only coloured papers like the abovementioned, but also uncoloured papers, will undergo a change under the action of light; they do not, however, fade, but grow darker and yellow coloured. If a piece of ordinary printed paper be laid in a sunny window under a glass plate the half of which is pasted over with black paper, the uncovered half will be found at the end of about eight days in summer to have grown perceptibly yellow. Not only, however, printing paper, but also photographic paper, will suffer in the same way. When Van Monckhoven drew attention to the want of permanence of the pigments used in the carbon process, Sawyer and Co., of London, proved that many of the papers which they had to use for transfer purposes were subject to turn yellow on exposure to the light. This same difficulty is met with in the case of photographic carbon, though it is in this instance more generally attributed to the effect of dust than to that of light. That the latter, however, plays a considerable part in producing the result is shown by an interesting experiment carried out in the laboratory of Messrs. Löscher and Petsch. These gentlemen exhibited in their show-case the photograph of a statue taken against a dark background, and mounted on cardboard. Six months afterwards the cardboard had toned a dark yellow colour, while the picture itself remained white, so it was taken out of the case, and the photograph removed from the cardboard by warm water. In the place where the picture had been there was then observed a perfect copy of the statue, although the picture had been completely protected from dust. The light seems to have penetrated through the light paste of the photograph, and to have turned the cardboard underneath yellow, while the spaces under the dark background remained perfectly white.

According to Dr. Friedländer the resin contained in the paper is the cause of its turning yellow under exposure, an opinion which is corroborated by the fact of pine wood becoming darker in the light. Many paper manufacturers are in the habit of sizing their paper with a resinous compound; papers, therefore, which are intended for photographic purposes should never be treated in this way.

As I have been led to speak of this disadvantage in the use of cardboard, I may perhaps be allowed to draw attention to another fault to which the same substance is liable: I allude to the appearance (so often observed) of yellow spots in photographs mounted on cardboard, the cause of which is not yet sufficiently well-known. It is, no doubt, partly due to the ornamental designs printed in imitation bronze or gold, and containing sulphur, and in some cases it may be caused by the fixing soda which the cardboard makers use to remove the bleaching powder, and which has not been sufficiently washed out. I have, however, had cardboards sent to me in which I could not find a trace of fixing soda, though the photographs which were mounted on them were quite covered with yellow spots. Upon this, I soaked some cardboards in a one per cent. solution of hyposulphite of soda, dried them, and then mounted photographs on them, but without a single yellow spot showing itself after an interval of more than twelve months. I imagine that in many cases where the sin is laid upon the cardboard, the fault is really caused by impurities in the paste used for mounting, or in the blotting-paper employed for drying.

Correspondence.

BROTHERLY LOVE.

Sir,—I am going to take a short holiday this month, and, like many of my brethren, I propose to carry with me a camera and some gelatine plates; like them, too, I propose to work wonders, if only I can get a little assistance on the way.

My work will be less, and the pleasure greater, if I can only induce a brother photographer on my route to let me into his studio to change my plates, and, perhaps, develop a negative or two. Is there brotherly love enough among photographers, think you, to grant me such a favour if I ask it? At any rate, I mean to try. So photographers about North Wales, and around the Snowdon Range more particularly, look out for a smart, handsome young chap, with a changing-box of his own ingenious construction, and a half plate camera.—Yours faithfully,

Notting Hill, August 3rd. VIATOR.

[We have no doubt our correspondent will be received with courtesy, but we think he should be provided with some sort of introduction, if it is only a card, and, perhaps, a carte-de-visite. Smart, handsome young chaps, with changing-boxes of their own construction, may be all right, but strangers like to know something of their guests, especially when unbidden.—Ed. P. N.]

PHOTOGRAPHS BY LIGHTNING.

Sir,—I was amused to see in your issue of June 18th a paragraph extracted from the *Charlottesville Chronicle*, entitled "Photographs by Lightning." Let me assure your readers that it is only another instance where ignorance and imagination have mistaken rust for the phenomenon alluded to. This rust manifests itself in a great deal of old glass, and is an efflorescence of alkali upon the surface, showing all the colours of the rainbow.

The portraits of deceased friends are only the offspring of a lively imagination. I could fill columns in your paper with accounts of similar delusions in different parts of our country and abroad. But it so happened that I investigated the earlier case reported in Charlottesville in 1875, and named in the paragraph alluded to, and I was convinced, from a letter received from one of the persons who was mistaken, that it was a clear case of rusty glass, whose colouration has taken a form which honestly deceived those who looked upon the window with a warm imagination and a preconceived notion that it pictured the portrait of a deceased friend. Such statements may always be set down as honest delusions or wicked frauds.

THOMAS GAFFIELD.

MEDICAL USES OF PHOTOGRAPHY.

Dear Sir,—With reference to your editorial remark in this week's Photographic News regarding the medical uses of photography, I may remark that the art has been in frequent use, during the past fifteen years, as a means of illustration of medical and surgical records. The facilities which dry plates afford the amateurs will, no doubt, largely extend its use. I am myself accustomed to take a pocket camera to the hospital once or twice a week, and the results (some of which I enclose) if inartistic enough, are most useful.—Yours truly, W. R. Gowers.

[Dr. Gowers encloses a most interesting series of very excellent photographs, illustrating various phases of physical distortion.—Ed. P. N.]

A NEW STANDARD FOR STUDIO EXPOSURE.

Dear Sir,—Cut adrift for the present from studio facilities, will you allow me to make what I believe to be a practical suggestion? It is to use Crookes' radiometer, in lieu of time exposures, in ordinary studio practice; thus, instead of counting seconds, and mentally judging of the time required to give a properly-exposed negative, take

no account of time whatever, but count the number of revolutions in the radiometer, mounted somewhat near the sitter, and assume that for an equal number of rotations plates of uniform sensitiveness will be in all cases properly exposed.

The experiment is so easily tried that I trust some one of your correspondents may be induced to put it to the test and report the result. The instrument is of too delicate construction to be used in the field.—I am, dear sir, yours very truly, JOHN SPILLER.

Talk in the Studio.

INSTANTANEOUS PHOTOGRAPHY ON PAPER.—The following extract from the *Sunderland Daily Post* has been forwarded to us:—"SIR,—May I respectfully request, through the medium of your journal, to make known to the photographic public a new photographic process which, I believe, when known, will work a complete revolution in that art. I say new, for I have not seen the process mentioned, nor even hinted at in photographic papers, yet it is very simple and obvious when pointed out. My invention is simply the application of what is known by the name of the 'dry plate process' to paper. It is as follows:—Prepare paper by immersing it in bromide of ammonium, say nine grains to one ounce of water. When dry, sensitize in ruby light with nitrate of silver, say forty-five grains to one ounce water; when dry, wash out the nitrate of ammonium in water; when dry, the paper is of the utmost sensitiveness; a print may be taken by a second's exposure, and developed in oxalate of iron in a minute. This, which I may call 'Smart's Instantaneous Process on Paper,' is, of course, capable of modification, but in the hands of photographers will soon be brought to perfection.—I am, sir, your obedient servant, COLLIN SMART."

PHOTOGRAPHIC ARTISTS' CO-OPERATIVE SUPPLY ASSOCIATION, LIMITED.—On Saturday last the employés inaugurated their annual fête, the rendezvous being the village of Witley in West Surrey, that spot being chosen for its complete rusticity as well as for the beauty of its surrounding scenery. Here the party met, and in the afternoon sat down to an excellent and convivial repast, furnished at the "White Hart." The chair was occupied by Mr. E. J. Stone, the manager of the Printing and Stationery Department; the vice-chair being taken by Mr. Collins, the head of the Apparatus Manufactory. The usual loyal and patriotic toasts were proposed and drank, as also "Success to the Association,' &c. Songs were sung, and the whole afternoon was passed in the most enjoyable manner. A notable feature of the dinner was a beautifully executed menu, printed by the lithographers of the Association in their spare moments in gold and colours, and setting forth the dinner, toasts, and songs.

PHOTOGRAPHY BY GASLIGHT.—We are informed that under the auspices of the Gas Company there is to be an exhibition in Dublin for gas appliances, and that Messrs. Edmondson and Co. are making arrangements to have, if possible, a gas photographic apparatus at work, Mr. M'Farland having promised to attend and take photographs by it at a fixed charge. It is expected that this will give an introduction for the apparatus to which allusion has been made in connection with the names of Mr. Laws and Messrs. Edmondson and Co. in these columns. The last-named gentlemen state, with regard to the light in the Clock Tower of the Houses of Parliament, that it is formed of two 68-jet burners, one over the other, ventilated by an arrangement they have used in the lighthouses, where they have four 68-jet burners over each other, forming, with the lens, a pillar of light.

THE ARTOTYPE PROCESS.—At the conversazione of the American Chemical Society, held on the evening of June 30, the *Scientific American* says that "some examples of the beautiful artotype process of photo-printing were exhibited, and much admired for their near approach to ordinary fine photographs, experts only being able to detect that they are printed. A very fine and large photograph of Lanyumantel's picture of the arrest of Lavoisier by the officers of the French Revolution was much admired."

THE *Echo* says:—"We learn that Mr. P. Barry, a member of the London Press, has discovered a process for the conversion of drawings into sharp relief blocks for letter-press illustration by merely pouring type-metal on them.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. PIPER AND CARTER, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. PIPER AND CARTER, *and crossed "Union Bank, Photographic News Account."*

A. AZILE.—There is no better method than to fuse your chloride of silver with dry carbonate of potash and a little borax or nitre, and then dissolve the button of reduced silver after washing in pure nitric acid. Details of the process will be found described by Mr. Nelson K. Cherrill in the YEAR-BOOK for 1879.

MARBLE.—Some kind of plain papers contain a good deal of hyposulphite, and this would cause a marbled stained appearance on treatment with a silver solution. Try a stronger silver bath, and float for two minutes only.

R. WILLIAMS.—Even in full lighting you would hardly be able to get street scenes with instantaneous exposure by the lens named; but try your hand first with a portrait combination, and advance to greater rapidity, adjusting your drop shutter accordingly.

ROSEBERRY.—There are several schemes of applying photography to wood-engraving, but the best, we think, is that in which the collodion film is bodily transferred to the wood block. Use dilute hydrochloric acid to assist in detaching the picture from the glass plate, and then float it into water, so that no appreciable quantity of acid comes in contact with the wood.

CYMRO.—We have known clean opal glasses (ground pot metal) to retain a considerable amount of water, and this may account for the stripping of the collodion film on drying. Use extra precautions to drive out moisture, or soak the plates in strong alcohol before using.

ONE IN A FOG.—Dr. Eder's formula for oxalate developer was given in last column of our number of 16th April, and repeated on the 21st May last.

D. DENISON.—We cannot recommend you. We have tried those of most makers, but should hesitate about giving advice. Some of the very best negatives we have produced from plates which occasionally yield very bad.

SHARK.—Your paper was not quite dry; it is always a risky proceeding to print without varnishing.

ENNIS.—Your Ross lens would give you the best picture under the circumstances.

MORGAN.—Three and a half guineas we should consider good wages; only first-class men can command more.

W. MAY.—Not till September.

DAYBREAK.—Flow with albumen.

M. M. M.—We hope shortly to carry out your wishes, but we can hardly tell you our plans.

E. NICHOLSON.—The chalk or carbonate of lime is added to neutralise the free acid which always exists in commercial chloride of gold.

W. L.—Thank you.

G. T.—We should have thought an ordinary shellac varnish would sufficiently change the colour of your iron negative, but the intensity of colouring may be further increased by adding a little aurine dissolved in spirit to the varnish.

J. BAKER.—Nothing is better than the matt varnish we lately described, and upon which further hints will be found in our YEAR-BOOK. Carbonate of ammonia in the hyposulphite bath is conducive to perfect fixation. The proportion is, one ounce to four ounces of hypo. Nitrate of silver is a good means of testing, as far as it goes, although we consider no test sufficiently delicate to rely upon.

L. A. L.—You have not washed your paper. If you sensitize on such a strong bath, you must wash afterwards, otherwise your paper will not keep. It is immaterial in what form you use the ammonia for fuming.

PYRO.—Then do not use any more of it. Make a solution of permanganate of potash of the strength you mention, and add a few drops of this to (say) a pint of your water; if the rosy colour disappears rapidly, the water is not to be trusted.

SILVER PRINT.—They have been left in the toning bath too long. Stop the toning while the prints retain their warm tint; you will then get much better results from your paper.

HARRY G.—A spirit level will do all you require. You must not copy without obtaining permission from the publishers.

H. F.—Either common salt or hydrochloric acid will do all you require

F. W.—The rule is never to have a diameter less than one-fourtieth of the focal length. What you specify is therefore out of the question.

PRINTER.—Gold toning is used by many, but it frequently imparts an objectionable tint; the iridium formula you mention is preferable, in our opinion.

W. A.—Repeated flooding will certainly remove it; try again, for we have never known it fail.

The Photographic News, August 13, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Thunderstorms and Gelatino-Bromide Work—Commercial Plates—A Magic Lantern and Six Slides for Threepence Halfpenny—Distortion of Lenses by Pressure or Stain.

Thunderstorms and Gelatino-Bromide Work.—Now that the capabilities of the gelatino-bromide process as a thoroughly practicable working method have been fully demonstrated, every circumstance which tends towards difficulty or uncertainty demands a most careful and exhaustive study. Several emulsion workers of experience have noticed that occasionally their labours have proved futile when the emulsion has been prepared, or has been kept in the liquid state, during a thunder-storm. Emulsion prepared under the circumstances referred to has been found to occasionally yield plates which proved to give foggy or veiled images, and to show all the signs of incipient putrefaction having commenced in the gelatine. The idea of atmospheric electricity influencing the results of emulsion work has, on the other hand, been ridiculed by some workers who have obtained excellent results with emulsion prepared during very violent thunderstorms. It is, in the first place, a tolerably well-established fact that an electrical discharge passed through an organic substance will sometimes very much increase any tendency which it may have to putrefy or decay. As an instance of this, we may mention the well-known fact that bodies of animals which have been killed by lightning decompose with extreme rapidity, and the notion that beer or milk often becomes sour during a thunderstorm may, perhaps, be something more than a domestic superstition. In connection with this subject it must be remembered that an electric discharge always produces a series of induction currents in all conducting bodies within its sphere of action, these induction discharges, when arising from a flash of lightning, being generally known as return shocks; and there are many cases on record of men and other animals having been killed by these secondary electrical disturbances. It may easily happen that circumstances may be occasionally favourable for the passage of slight return shocks through an emulsion; while on other occasions a thunderstorm may take place in the immediate neighbourhood of emulsion operations without in any way influencing the result. The following experiment will, however, sufficiently demonstrate the necessity of carefully testing plates prepared from an emulsion which has been exposed to the action of electrical disturbances. A small quantity of gelatine emulsion which was found to yield good results was divided into two equal portions; one of these was placed in a flat glass cell and exposed to the inductive action of a series of electrical discharges passing between a pair of brass balls two inches apart, and placed immediately outside the glass cell, precautions being of course taken to prevent the light produced during the discharges reaching the emulsion. From each portion of emulsion a plate was prepared, rapidly dried, and exposed, but no difference was noticeable; the emulsion which had been exposed to the electrical action giving as good a result as the untreated sample. A similar pair of plates, however, which were allowed to dry slowly, showed a result which was in favour of the unelectrified sample; the plate which was prepared from the electrified emulsion showed that peculiar veil or fog which generally arises from an incipient putrefaction of the gelatine. After both samples of emulsion had been kept for three hours, fresh plates were coated, rapidly dried, and exposed; but the result indicated that the sample of emulsion which had been exposed to the influence of the electric discharge was undoubtedly in a state of decomposition.

Commercial Plates.—There can be very little doubt that the preparation of gelatine plates will become more and more of the nature of a manufacturing operation, and that working photographers will be less and less willing to exercise the constant care and study which are requisite for the production of uniformly excellent dry plates. But, at the same time, every discreet photographer will provide himself with the means of preparing his own plates, and occasionally make a batch, in order to be independent of the plate-maker as far as may be practicable. Commercial plates have now attained a high average of excellence, although it may occasionally happen that carelessness on the part of makers renders their productions entirely useless. As an instance of this we may mention that we recently obtained three dozen plates from a maker of excellent repute, and on opening the packages were surprised to find that the films were not separated by the usual guards of crimped or kilted paper, but that they were merely wrapped in the orange packing paper, this being in immediate contact with the films. A very slight adhesion between the paper and films showed that the plates had been imperfectly desiccated, or that the packing paper had been damp when made use of. Having no other plates at hand, we took them out and exposed twenty-eight of them—but alas! with what result? Insensitive patches rendered every one useless, the mischief being no doubt due to the contact of the films with the coloured packing paper, the presence of a trace of moisture obviously acting as an aggravating circumstance. Again, we know of a case in which, out of a dozen plates, ten were an eighth of an inch longer than the nominal size, and consequently refused to enter the slides; and we all know what a trouble it is to cut the eighth of an inch from a plate in a nearly-dark room. On a recent festive occasion the Rev. F. F. Statham referred to photography as being calculated to indirectly improve the moral and religious condition of the people; but the dry plate makers had better take care, or some of the expressive interjections which they may cause photographers to use in the dark room may escape into the outer world, and such an event might cause Mr. Statham to modify his good opinion regarding photography.

A Magic Lantern and Six Slides for Threepence Halfpenny.—A small tin lantern about three inches high, with lamp, slides, and two lenses, is actually being now sold in London at the above-mentioned price; while a larger one of a similar character costs the somewhat more extravgant sum of sevenpence three-farthings. The small lantern is of German make, and when one considers that the manufacturer cannot get more than twopence for the article, it is a matter of wonder how it can be produced for the price. Very little can be said as regards the artistic merits of the slides, but, like the old Dutch tiles, they at least possess the merit of being hand-painted—if, indeed, this be a merit. The lenses, which as regards optical work are superior to many spectacle glasses sold in London, give, as an advertisement would put it, "a brilliant illuminated disc six inches in diameter." There is also sold in London, at the present time, a toy camera-obscura about the same size as the magic lantern in question. Who knows but what the present pushing age may produce a small tin photographic camera, double slide, two dry plates, and lens for about a shilling? It could certainly be done if the work were executed on the same scale of cheapness as in the case of the magic lantern. It is, perhaps, not generally known that a very passable photograph can be taken with a common penny magnifying glass, if it be stopped down and a proper adjustment made for the difference existing between the chemical focus and actinic focus.

Distortion of Lenses by Pressure or Strain.—Many photographers have from time to time remarked that it is occasionally impossible to focus an object sharply and clearly, even with a lens known to yield a satisfactory result in ordinary cases. Setting aside such obvious causes as light shining into the lens, or the presence of moisture on one of the glasses, there can be little doubt that the most frequent source of the difficulty in question is a bending or distortion of the objective by some mechanical force acting on it. In the case of lenses burnished into their mounts, a

contraction of the ring by cold may distort the lens uniformly, if its fit in the mount is accurate, merely altering the focus and disturbing the corrections of the instrument. If, however, the cell in which the lens may be mounted is not turned with extreme accuracy, or if the outside of the lens itself is not truly round, so irregular a distortion may arise as to altogether destroy the defining power of the combination to which the lens belongs. There is no question that the practice of burnishing lenses into their mounts has its disadvantages, for when this plan is adopted the operator has no easy remedy against a "frost-bound" lens, excepting to keep the instrument warm during the time he is using it. If, on the other hand, the glasses are not cemented in their cells, they are liable not only to be misplaced by careless persons, but also to be distorted by being screwed down in their places by an undue degree of force. Lenses should generally be left just the least bit loose in their mounts—not quite enough to cause any possibility of shaking, but the right degree of looseness can generally be estimated by making an attempt to turn the lens in its setting. Few persons realise the ease with which glass bends and yields to pressure.

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."

No. 8.—Only a Tramp.

This is a good negative. It is a bust. You will observe a few stains on the coat; they do not come from careless manipulation—they were on the coat when I made the negative. That in itself, combined with the haggard look, tells its tale. The sitter was "only a tramp," in the given language of this matter-of-fact world; he was weather-beaten—he was in rags—he was starving—indeed, he was dying—when I made this negative; and do you know that this poor fellow was one of the cleverest boys at Blair's College, and used to share the same bed with me in the dormitory? That was five-and-twenty years ago. I can remember Dod Watson—I see him now with his bright eyes, his frank honest look, his strong form that could beat us at all athletic sports; and now, when I look through this negative—when I see the hollow eyes—when I see the pinched look—it makes me feel sad. It brings back old times—the school days—those wild frolicking days that are never to be forgotten. But I must not write like this, I must try and be practical. I am afraid that I cannot say a great deal as regards the practical working of this negative. Indeed, I do not know if it is worth while for me to tell any of the little dodges of the old process—the wet collodion—when every one is on the move towards the dry plate work. Yet I hope that these little sketches of a time gone past will still find interest in the eyes of both old and young. They will remind the old worker of the time when he struggled hard against the stream; when he had to work as a man can only work who means to get over the troubles that surround him; when he had to work, not only for his bread and his family, but for the pure love of the business. That in my estimation is half the pleasure of life! Heaven help the poor fellow who labours at a business that his heart and soul repels. In the latter case—

> "I'd rather be
> The servile hind for hire, and eat the bread
> Of some man, scantly himself supplied,
> Than sov'reign empire hold o'er all the shades."

And to the younger members of our art they should prove interesting as mementos of the past, and—may I likewise hope?—inculcate some good lesson that may prove beneficial to them through life.

Now for my print.

It was a sweltering day. I was manager of a studio in a certain city not a hundred miles from the town of Prince Bladud, and having a busy day—being disappointed in my dinner—was trying to recruit my exhausted powers by the potent charms of a glass of stout, when the youngest apprentice made his appearance. He had a grin all over his face—not a small one—which indicated that he thought something witty was on the *tapis*.

"If you please, Mr. B., some one wants to see you."

"Who is it?"

"Only a tramp!" was his grinning answer.

My thought now was that my visitor was one of those poor forlorn wretches that you meet wandering slipshod all over the country, and thinking to make him happy by the present of a sixpence, I enjoined the boy to go and give him one. What was my amazement to hear, upon the lad's return, that the "tramp" did not call for charity; but, learning that Geo. Bradforde was in the house, he wished particularly to see him.

The poor fellow would not come up to the reception-room, so down I had to go to the lobby; here I found the poor chap, ragged, haggard, and, as I said before, dying. I looked upon him rather indifferently at first, deeming him a stranger; for who could recognise in that poor wretch Father Gordon's pride—the best scholar in the college—my old chum? For a moment he looked at me, then, lowering his eyes, he cried more than spoke.

"Geo.'! Geo.'! don't you know me?"

Once before I had heard words like those, years ago, when I was wrecked at North Shields on the S.S. *Stanley*. I believe that I was one of the last on board, and to this moment I cannot tell how I got ashore. Enough if I say that the first words I heard from the lips of one near and dear to me were, "Geo.'! Geo.'! don't you know me?" Those words used to ring through my ears night and morning. The despair and agony in the tones roused me from my lethargy, and I soon was able to tell her that I knew her; but they were as nothing compared to the tones of the tramp.

In one second I had raised the lowered head; I gazed in the sunken blue eyes; there was a flash of a time gone past; and I embraced the "tramp."

What was said and what was done during the first hour I think it would be out of place for me to tell; but when sundry arrangements had been completed, my old poor ragged chum spoke as follows: "I have not come begging, Geo.'; I have money" (here he chinked a few shillings together); "enough to do my turn, at any rate. It was by the merest accident that I learned you were here, and thinking upon old times, Geo.', when we were boys together, I thought that you would not mind doing me a favour.

"I will do everything in my power to assist you, Dod," was my hearty answer while giving his thin hand a shake. "But one question, old chum—how did ever you come to be like this?"

There was one of the queerest looks passed over his wan face that ever I witnessed. He took hold of my great shoulders in his hands, and, while looking at me something in the old manner, he said, "There used to be a favourite song of yours, George, and it will explain the whole matter: 'Why did she leave me? Because I was poor!' As I said, I did not come begging, but you can do a last kindness to me; just make a nice picture of me. If you like I shall pay you for it, for you ain't boss here; just make a nice one. She's married, old fellow, but it won't be doing her husband any harm to have a picture of a poor chap 'that loved not wisely, but too well.'"

That was how I made this negative. If my eyes were dim in the dark-room, I do not think that any one will say that I should feel ashamed of it.

I had to send the print to a Mrs. A—, in Ireland—to send it without any comment. In a day or two I received a letter marked "Private," a five pound note enclosed, and the simple question: "Where is he? Please forward enclosed." My answer was shorter than her question: I returned the money with "Found dead!" on the sheet of paper wrapped round it. According to everyone's opinion he was "only a tramp," yet to me he was my old chum—my bed-fellow—and I must finish this paper by saying R. I. P.!

At Home.

THE NEW AUTOTYPE GALLERY IN OXFORD STREET.

We could not quite convince Mr. Bird, the manager of the Autotype Company, that the fire which burnt down the old premises in Rathbone Place was, after all, not such a very unfortunate affair. The Company has secured a better frontage in Oxford Street, where the public can see more of the pictures, and if a fine collection of valuable paintings and photographs were destroyed, it has been quickly replaced by a series not less large and costly. Such was our argument, but it appears there are others equally cogent which are best known to the manager himself. Be this as it may, the new Autotype Gallery is a very handsome one, and since it is an establishment in which the painter and etcher join hands with the photographer, our readers will feel some interest in its welfare. We may mention that any photographer, whether professional or amateur, is quite welcome to visit the Gallery without fee, and so numerous is the collection of paintings, engravings, and photographs, that the Company has just issued a catalogue of upwards of a hundred pages descriptive of them.

Naturally enough, it is the paintings that first attract attention. Two pictures, the property of the Baroness Burdett Coutts, are sure to please. They render the pathos of our London poor, and would have stirred the heart of Charles Dickens had he seen them. The painter is Mr. F. W. Lawson—a brother of Sir Wilfred—and the works are valued at several thousands a piece. One of them, "Children of the Great City," represents a sick child, stretched on a palliasse in a London garret, while the nurse, a ragged pale-faced urchin, looks out wistfully at the red sun setting over the soot-beaten roofs and gables around him. "Imprisoned Spring" is a not less pathetic picture. Two children, a boy and girl, are standing by the railings of a London square, and through the black bars is seen an almond tree freshly burst into blossom; the lad has put his ragged arm through the bars to pluck at the flowers, while the girl furtively looks round to see if anyone comes. Hard-by the painting stands the artist's sketch in monochrome; it is of the same size precisely, and it is the aim of the Company to reproduce the latter in permanent pigments. Unfortunately the railway, in conveying the sketch to the Company's works at Ealing, allowed it to fall, and the drawing was fractured in twenty places. Skilful hands, however, devoted themselves to the task of mending, and the result before us shows not a trace of the damage. Even the artist himself, we are told, could not discover a fault when he set eyes on his picture again; all, indeed, would have been made happy once more, if it had not been for the sharp observation of the camera, which, here and there, Mr. Bird tells us, found out a weak place, of which the human eye took no cognizance. But in the end these defects were also remedied, and not even the most sensitive (of plates) can now discover an eyesore.

The Autotype Company intend to do much of the work that has hitherto fallen to the lot of the engraver. Instead of a painter having his work engraved upon steel—a slow and costly undertaking—it will be reproduced in permanent pigments. The Autotype Company have chosen, under the advice of artists of repute, a warm sepia tint, and it is in this tone that the majority of their works of art will be printed. For the information of our readers, we may say that tissue of the same kind can be obtained from the Company, who are not only quite willing to supply the material they use, but also any information that may be required by photographers in printing. The manner of reproducing a painting in Autotype is well worth describing. We will suppose that the painter himself, or somebody who has purchased both painting and copyright, is anxious to have his picture multiplied by carbon photography. It is taken to the photographic studio and copied by means of the camera of the desired size. The result is a monochrome picture, excellent, maybe, in many respects, but capable of improvement in the eyes of the painter. The reds in the picture have been rendered too dark, while the blues in the picture are shown in the photograph but very indistinctly. The painter, therefore, sets to work on the monochrome, and modifies the lighting where this is necessary, and with a few touches, probably, renders the light and shade more true to the original. Further negatives are now taken, both large and small, and copies printed off in any number, possessing all the attributes of the monochrome that has passed through the hands of the artist. Here is a painting of Windsor Castle with the warm effects of a glowing sun; here is a monochrome photograph of the same after it has been touched by the artist; and here is a photograph in warm sepia produced simply by mechanical means. We have therefore the three steps before us, and the photographic result is certainly a triumph. A monochrome painting of Henry Irving, and photographs of it the size and tone of the copies, are close by, and so nearly alike to the original are the photographs that an unskilled eye would fail to tell the difference.

Passing from the paintings, we come to a series of eight albums of carbon reproductions, which represent a vast amount of labour and enterprise. They include no less than 1,188 examples from the galleries of Florence, the Vatican, Louvre, Luxembourg, &c., produced under the auspices of the great firm of Ad. Braun et Cie, of Dornach. We have said that this complete series of reproductions represents much hard work and talent; it represents something else besides. The admirers and purchasers of works of art such as those to be found in the Sistine Chapel are few and far between, and if it had been for them alone, these photographs would never have been executed. They are due in the main to the late Emperor of the French, who seconded in a most systematic way the work of the Dornach firm, and imparted to this something of the prestige of an Imperial establishment. The photographers of Adolph Braun were armed with introductions to foreign potentates and instructions to ambassadors throughout Europe, and the results of these efforts are here before us printed in permanent pigments, and affording invaluable treasures to the connoisseur and art student.

Another feature, and one again for which artists must ever be grateful to photography, is the multiplication of Turner's well-known *Liber Studiorum*. A new edition of these studies has been prepared from rare prints in the possession of the Rev. Stopford Brooke, M.A., who has given the advantage of his judgment and criticism in the preparation of the Autotype plates. The collaboration of Mr. Brooke, it appears, has, however, only been secured conditionally on the publication and sale of single copies at a price within reach of students of narrow means, and hence it is possible now to purchase a *facsimile* of the most rare example of Turner's work at half-a-crown and three shillings and sixpence a-piece.

Of other drawings and etchings reproduced by Autotype we have little time to speak. Here are "Three Summer Days," from the drawings of Poynter, and consequently as valuable, well-nigh, as the originals themselves; here a selection from the works of Sir Joshua Reynolds; and here again Autotype examples of representations of beautiful women. But we must pass on and allude to a branch of the Autotype Company's work that more directly interests the photographer. We have here Wilson's "Seven Ages of Man," Mrs. Cameron's sketches, Mr. Faulkner's tiny models, and some lovely pictures of Thames scenery by various photographers. The Company are endeavouring to promote the sale of pictorial photographs by showing them in the Gallery, and it must be admitted on all hands that this is exactly what is wanted. Many of our photographers produce pictures which would command a ready sale if only the public could see them. At present, beyond the annual

exhibition at Pall Mall, the photographer has no opportunity of exhibiting his work in public at all, unless the few print-sellers who permit photographs in their windows take a fancy to his pictures. The Autotype Company offer to photographers this facility, and we hope that ere long their example will be followed by many other galleries in London. As might be expected, the Company make it a rule to deal only in prints produced in permanent pigments, but as photographers would in most instances be only too glad to have their work thus printed, the condition is likely to prove an inducement rather than a bar to negotiations.

A visit to the new Autotype Gallery also permits the photographer to judge of the wide field at his disposal by the printing of pictures in pigments of various hues. As we have said, the favourite tint of the Company is a rich sepia, which is eminently adapted for the rendering of monochromes, since the pigment gives warmth and colour, while affording considerable contrast. Pictures are obviously to be improved by the judicious selection of a pigment, and the opportunity for studying this question is of itself well worth a journey to Oxford Street.

Faulkner's "Studies from Life" are a noticeable feature in Autotype art in relation to direct photography, and illustrate pointedly the capacity of carbon printing to assist artistic work of this kind. Mr. Faulkner's "Little Darling" and "Simplicity" are widely known, and no less than thirteen other examples of the same genre are on view at the Autotype Gallery, and command, we are told, liberal patronage from the public. These studies are attempts to combine effects beloved of Sir Joshua Reynolds with photographs direct from nature, and form very exquisite pictures. It is well known that Mr. Robert Faulkner is an artist by instinct, training, and hereditary gifts, and it is not everybody who can hope to achieve the same success; but we can indicate his method of procedure, and leave our readers to profit by it.

The first thing is to get the nature negative; to find the child-model with necessary physical gifts, and with the quick intelligence to be swayed into such modes of expression as may suit "The Smile," "The Frown," "A Sailor Boy," &c. A technically perfect negative being obtained, anything in the shape of retouching is scrupulously avoided, and a transparency is made, developed either with pyrogallic, or iron, according to the quality required. Great attention is paid to the transparency; high lights are scraped out, shadows increased, an accent added here and there. A powder image is then produced, and finished with the greatest care, and from this powder image a negative is made. The negative is printed by the carbon process in either sepia or red chalk tissue, and this final stage is the part Autotype plays in the result, dowering the print not only with permanency, but adding a distinct artistic value to the pictures. In fact, every part of the work, from the first stage to the last, is carried out with artistic insight and conscientious care, Mr. Faulkner printing the pictures himself, as a general rule, although the large number of copies sold occasionally compels him to entrust the Autotype Company with the work; but, as the manager informed us, they did not hope to content the critical spirit of their client until Robert Faulkner could be engaged at an ordinary printer's salary, which was not expected till the millennium.

The grand studies of lions by Henry Dixon, which obtained a well-deserved medal at the last Exhibition, are here as cabinets at one shilling, and twelve by ten pictures on cardboard, retailed 6s. and 5s. each. These presentations of the king of beasts attract both artists and the general public, and have led Mr. Dixon to further zoological enterprise; and a series of studies of tigers are now in course of publication, and these are fully equal in merit to the lion pictures. The production of these prints is wholly by the new photographic agency of gelatine, the original negatives being taken on dry plates about 2½ by 2 inches.

The records of the photographic activity of the late Julia Margaret Cameron are to be found here in frames on the walls, and in a handsomely bound album, containing some seventy examples of her art. Looking through this volume one perceives the struggles and the artistic instinct to impress its individuality on work done through the camera, to overcome the mechanical trammels of the process; and one can estimate the partial success obtained. Such portraits as those of Herschell, Tennyson, Sir Henry Taylor, Miss Mabel Bateman, &c., however much blurred by technical carelessness and by being purposely out of focus, yet bear unmistakable impress of the art spirit, and are, in a class, apart and above the ordinary productions of the studio.

Some five years ago Mrs. Cameron found the films of her most valuable negatives splitting and peeling, and entrusted the Company to reproduce negatives from selected silver prints. This work was carried out most satisfactorily, all the artistic merits of the originals being preserved while stains and blotches were softened down or obliterated. The great range of monochromic expression possessed by Autotype enabled special effects to be obtained to suit the various subjects. The death of Mrs. Cameron must be considered a serious loss to photography, and we know of no distinguished amateur with the social position and means possessed by this lady who carries a similar ardour into the pursuit of the highest possible photographic expression.

The "At Home" next week will be "Mr. Jabez Hughes at Regina House, Ryde."

PHOTOGRAPHY AND THE INDUSTRIES.

BY DR. H. W. VOGEL.*

Photography, as a young, progressive art, opens up daily new branches of industry. Some time ago it co-operated with engraving and lithography, and it has long since left the workshop of scientific photography to become the helper of the draughtsman, who uses it to reproduce drawings by means of light under the name of the "Lichtpaus process." But lately it has advanced in other directions, with which its principal aim—the production of prints, which has so long engaged the attention of scientific photographers—is now of minor importance: I mean the application of photography to various industries. As an example may be cited the production of ornamental designs on wood, metal, glass, &c., by means of photography, as they can be easily enlarged or reduced in size.

The first steps in this direction were the "burnt-in" photographs on glass or porcelain, and these opened up the field for various decorative purposes. For some time the process was almost entirely employed for the reproduction of portraits or woodcuts, a somewhat one-sided application of ceramic photography. Grune, ten years ago, was the first to take negatives of drawings of ornamental designs from which he obtained a collodion positive; this was left in a gold bath until a gold picture was obtained; the collodion film was next transferred to the porcelain, which was then fired, and glazed. Unfortunately, the inventor did not receive sufficient encouragement, and the process was therefore given up.

Woodbury's experiments in the formation of water-marks in paper have been attended with greater success. He obtained a carbon picture countersunk in the lights and raised in the shadows. From an impression in metal a sort of die was made, which, being pressed upon paper, gave a water-mark.

Werner and Schumann, in Berlin, have, in this manner, printed not only portraits and landscapes, but also designs of all kinds as water-marks.

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* *Photographische Notizen.*

Lately, photography has entered into the working of metals. Steel seals are finished by means of light, the art of production being a kind of etching. Steel plates are coated with asphalt, and receive an impression from a negative upon which the design has been obtained; they are developed with turpentine, and the plates are then etched with acid, and a raised design is thus obtained upon the steel. The stamp is then hardened, and it is easy to obtain impressions upon metal from it by heavy pressure, the ornament being a metallic intaglio similar to an engraved plate. Falk, of Berlin, works in this manner upon thin copper bronze plates, and these, being bent into cylindrical or spherical forms, are made into lampstands and other things for which there is a steady sale in Germany.

Trials have been made to simplify this process by taking a lithographic or carbon transfer directly upon the metal, and then etching; the shadows, preserving their relative gradation in the drawing, remain in relief by etching.

An extensive use of photography is made in the ornamentation of glass by means of the sand-blast. It is an extraordinary fact that beautiful positives on glass, made by the carbon process, have found little favour with the public. Even the window transparencies, produced with the help of the Woodburytype, by Goupil and Co., in Paris, found no sale, although they did not fail for want of strenuous exertions on the part of the inventor.

The carbon transfers now serve as masks in the grinding of glass by the sand-blast machine, all exposed parts of the picture being rendered matt by the blown sand, those protected by the carbon film remaining transparent.

For the more common work of this kind the carbon transfer is certainly too costly, and printed patterns or lines are employed; but for intricate drawings, which cannot be well printed, photography must be used. In the Vienna Exhibition the inventor of the sand-blast machine showed some admirable specimens thus produced. These were then rare, and none could be obtained, even from the inventor; but now they can be had in Berlin and elsewhere.

These are only a few examples of the uses of photography in the industrial arts, which, in course of time, will show a more extensive development.

PHOTOGRAPHY IN INDIA.

BY W. T. WILKINSON.

With the exception of those in Bombay, Calcutta, and Madras, photographers in India are not stationed in one place all the year round, but, like their clientelle, migrate to the hill sanitariums in summer, and in the winter to the plains.

The general class of work produced by European photographers in India is excellent, and not far behind the very best in England, in either technical or artistic excellence; and when it is considered that most of the portraiture is done in portable canvas tents, this must be held as very creditable indeed.

During May, June, and July of last year, I was in Murec, the Hill Station for the North Punjab, 8,700 feet above sea level. The first few weeks were very pleasant; the grand mountain scenery, the tall pines, the May blossom, and the call of the cuckoo, combined with the cool bracing air, were very grateful after two years and a-half spent in a hot moist climate like Ceylon. But when the monsoon rains commenced, a most uncomfortable state of things prevailed; for over a week we were enveloped in clouds and mist. Now it cannot be denied that clouds look very nice indeed floating lazily along a blue sky, or as an artistic finish to a picture, but to be in amongst them they are not at all nice. Putting aside the mere personal discomforts of being up in the clouds, it must be admitted the scenic effect is grand; the swiftly moving masses of vapour, sweeping up the valley and over the hills, now obscuring everything, and ever and anon through the rifts opened by the wind giving glimpses of sunlit hills and valleys, while far away in the extreme distance the snow-capped tops of the Himalayas tower high into space.

It was time the rain came, as the edict was ready ordering all horses, &c., out of the station, and limiting each household to a stated quantity of water per day. Think of that, you who have only to turn a tap and get all the water you require, instead of having it brought in in sheep-skins carried by bheesties from a distance.

Photography under these conditions assumed its norma aspect. Before the rains I had met with many difficulties especially in printing, finding a great difficulty in getting anything like the proper amount of vigour, a difficulty, however, I conquered by ammonia fuming, and as I about this time adopted the formula published by Mr. Blanchard, I found no trouble in keeping paper white for a month after sensitising.

About the end of June, cholera broke out and stopped business altogether, as communication with the neighbouring camps was interdicted, so about the middle of July I left Murree, and descended into Rawul Pindi, and, although only forty miles away by a cork-screw road, in a different climate altogether.

In Murree, ordinary European clothing was none too warm; in Pindi, any at all was too much, the heat being so great that is was scarcely bearable to be away from the punkah. Now, in such a temperature I expected to be beset by all sorts of difficulties, but, to my surprise and gratification, I was not, all the solutions working harmoniously and well. Certainly, I had plenty of trouble dodging the dust, but the lavish use of a damp leather enabled me to keep that down.

The sample of varnish I was using gave me a little trouble on account of its tackiness under the heat, but I got over that by making some according to the formula given in the Year-Book for 1879 by N. K. Cherrill, which gave a surface like granite, and resisted continued exposure to the sun.

I also, for the first time since leaving England, got red fog when intensifying, and was able to trace it to the soda used for removing old films, and which had not been thoroughly neutralized by the acid solution before albumenizing.

I had with me a five-ounce bottle of Wratten and Wainwright's London washed emulsion, which I used wet, and got some fine views with it in about half the time of the ordinary wet collodion. I developed the negatives (12 by 10) in a dish, substituting nearly fifty per cent. of methylated alcohol for water in making the pyrogallic developer, and if it had been possible to have obtained the ingredients for making emulsion I should have discarded the wet collodion process altogether; but alas! India is a long way from England, and the prices were prohibitory.

Gelatine plates I could not make when travelling, but in the cold season at Mooltan I made several batches successfully.

Whilst at Mooltan, an amateur photographer showed me a plate which he had partially exposed in England four years ago in a very bad light, and had put away amongst a lot of unexposed plates, and the lot were forgotten; in April last they turned up unexpectedly, and by some fortunate mischance only half the plate was exposed, and, upon development, the old image made its appearance.

We regret to hear that Mr. Moorse's photographic warehouse in High Holborn was entered on Tuesday night by burglars, who carried off several valuable cameras and lenses. In case any of our readers should be offered any new universal or pocket cameras for sale, they will be rendering a service by communicating with Mr. Moorse.

The Photographic News.

Vol. XXIV. No. 1145.—AUGUST 13, 1880.

CONTENTS.

PHOTO-LITHOGRAPHY BY THE AID OF ALBUMENIZED PAPER AND GELATINE PAPER.

We have several times referred in these columns to the production of photo-lithographic transfer paper. Some prefer to employ for this purpose albumenized paper, others choose paper which has simply a gelatine surface.

So far as we know, albumen is generally favoured. It is usual to treat the paper, after it has been sized, with a mixture of—

White of egg	5 parts
Bichromate	1 part
Water	14 parts

Or the albumen is applied, without bichromate, to the paper, and the latter is then sensitized upon a bichromate bath to which some alcohol has been added, so that the albumen may not dissolve in the sensitizing liquid. The formula best adapted to such a bath is:

Bichromate of ammonium or potassium	1 part
Water	15 parts
Alcohol	4 ,,

The operations of sensitizing, drying, and exposing are well known to our readers.

The treatment of photo-lithographic albumenized paper is a very simple matter, and for this reason it is so commonly used now-a-days. The principal advantage of the albumen method lies in the circumstance that you can so easily and quickly apply your ink when once diluted with turpentine. The whole surface of the paper is uniformly treated, the superfluous ink being removed afterwards with a soft tuft of cotton-wool. The operation, as we have said, is exceedingly simple, and the development of the image afterwards, with a sponge dipped in cold water, is rapidly effected.

There is, however, one disadvantage connected with the use of albumenized paper—very delicate shading, like that in maps, &c., is sometimes injured by the mechanical development, if not removed altogether.

Gelatine paper, on the other hand, involves rather more time and trouble. When ink is applied to the dry printed surface (and this is further washed with a sponge to obtain the transfer), there usually remains behind a darkish tone, or, at any rate, a little grease upon the lights, which imparts a grey appearance to the photo-lithograph. For this reason it is usual to dip the gelatine paper bearing the printed image into cold water, blotting it afterwards upon filter-paper, to remove the superfluous moisture prior to the application of the ink roller. But in order that the ink may penetrate sufficiently deep, it is almost indispensable to employ a soft velvet roller upon the gelatine image.

We repeat, that the operations with gelatine are more delicate and laborious than with albumen, but the former permits the reproduction of lines of surpassing fineness, such as albumenized paper fails to yield. We have on several occasions given in these columns particulars regarding the production of gelatine transfer paper; but the process employed at present by the Ordnance Map Office in Vienna has so many advantages that we take this opportunity of briefly referring to it.

In Vienna, for some time past, photography has rendered important assistance in map-making. By its aid the tedious process of engraving on metal has been superseded altogether. A draughtsman simply produces the map on a large scale upon paper by means of indian ink, and this is then photographed and transferred by the ordinary photo-lithographic method. Working in this manner, Austria is able to produce her maps in a fourth the time, and probably at one-fortieth the expense, incurred by other nations. To Captain Volkmer, we believe, is due, in a great measure, the order of things as they at present exist in Vienna, as also the plan of producing the transfer paper which we here describe.

A sheet of well-sized paper is dipped into water, and, as soon as thoroughly soaked, it is withdrawn and drained. A horizontal glass plate receives the paper, and by means of filter paper and the application of a squeegee all air-bubbles and superfluous moisture are removed. The margins of the paper are bent up to the extent of half-an-inch to form a tray, and warm gelatine solution poured upon it, one part of gelatine being dissolved in thirty parts of water. The sheets so treated are dried and stored for use. Twenty-four hours before employment the gelatine paper is immersed for three minutes in a saturated solution of bichromate of potash, maintained at as low a temperature as possible. The sheet is then withdrawn, and placed face downwards upon patent plate, when filter-paper is again applied to remove superfluous liquid and air-bubbles. Sensitized paper of this description may be kept in the dark without injury for eight or ten days. Under ordinary circumstances it is thoroughly printed with 15° or 16° of Vogel's photometer.

When printed, the paper is dipped into cold water for a few minutes, and then drawn, face uppermost, upon a glass plate, filter-paper being applied to remove superfluous moisture. Should the gelatine swell to such a degree in these circumstances that the finest lines accept ink with difficulty, or not at all, then the printed sheet is first of all immersed for a minute or two in a dilute solution of chrome alum, say of the strength of one part alum to two hundred of water.

Meanwhile, the transfer ink is thoroughly worked up with a little oil of turpentine upon a stone surface; a little of it is applied to an ordinary leather roller, this again worked upon a stone surface, and the ink then applied, in a fine, even surface, to a zinc plate. A little of the ink is now taken up by the aid of a velvet roller, and applied to the moist gelatine image.

Should the gelatine surface, in the meantime, have dried to any extent, it is dipped once more into water, and treated as before. Any dirty markings produced in manipulation are removed with a wet sponge, or by gentle rubbing with the finger. Finally, the image is put between sheets of dry blotting-paper to absorb the greater part of the moisture, and in an hour afterwards is transferred to stone in the lithographic press.

From the results we have seen of this Austrian method, we confidently recommend it in the case of very fine work, and for reproductions upon a reduced scale.

PORTRAITURE BY GASLIGHT.

The publication of Mr. Laws' system of photography by gaslight has brought us a whole budget of letters. Some of our correspondents ask for particulars about the cost of burners and the expenditure of gas, and others require further details regarding the mode of employing the gas flame and its reflector. We beg to assure the latter body that there is nothing elaborate or complicated about the system at all; if they will only do us the honour of reading

once more the description we have given, they will find most of their questions answered already. In our "At Home," we placed above all things the point of simplicity, and as much as said that Mr. Laws' apparatus was scarcely worth looking at, it was so stupidly straightforward. It is a multiple gas-jet, standing in a Dutch-oven shaped reflector, with a screen of blue glass in front to prevent the light and heat annoying the sitter.

Mr. Laws, as we have said, has tried naphthalising his gas; but, nevertheless, the remarks of an esteemed "Occasional Correspondent" in our last week's issue are well worth taking to heart, for it is very certain that, during the coming winter, gas illumination will be resorted to in many studios. If it pays to employ electricity and to keep an engine going for portraiture (as in the case of the Van der Weyde studio, and that of the London Stereoscopic Company), or to use the Luxographic process, with its somewhat complicated illuminating arrangement, many photographers will surely deem it worth their while to spend ten or twenty pounds to fit up a gas-burner proper to the taking of pictures in their glass rooms. We fully believe, now that Mr. Laws has shown the way, there will be little difficulty in increasing still further the actinic quality of the light without augmenting in any way the expenditure of gas, and, provided with a blue glass or other suitable screen, there is no need to fear inconvenience to the sitter.

The advent of electricity for lighting up streets and bridges has caused a wonderful stride to be made in the matter of gas illumination, and we have now at our disposal burners whose dazzling brightness almost seems to equal that of our electric lamps. At street corners and crossings in nearly every town in the kingdom these last successful efforts of our gas engineers are to be seen, and photographers who know the capacity of gelatine films will have no doubt as to there being here ample light at one's disposal for the taking of portraits in a few seconds. Five pounds is the cost of the Wigham burner employed by Mr. Laws, but if there were a demand for such things for photographic studios, there is little doubt that still cheaper and better jets would be the result.

Mr. Laws has been good enough to promise a few more details in respect to gas-meter, cost of gas, and expense of reflector and glass screen, and these we shall lay before our readers at the earliest opportunity.

Notes.

Mounting dry is usually resorted to now-a-days in photographic establishments where large quantities of cartes and cabinets are produced. The prints prior to trimming are coated with starch and permitted to dry. They are then cut to proper size, and carried into the mounting room. A card is damped with a sponge, a print placed upon it, and the two sent through rolling press. Prints are mounted most quickly and efficiently in this way, but the method will not answer where there are wide margins; for in this case picture and card cannot be well put into the rolling press together.

The hands of the mounter always remain clean under these circumstances, for they touch nothing but the damp sponge, and a cloth kept close by permits him to dry his fingers if necessary. It is a bad practice, as most of our readers know, to mount prints, or at any rate portraits direct from the washing water; the distortion of the features from the effects of the wet paper stretching is sometimes exceedingly marked when this plan is followed.

In laying the foundation stone of the Temple Bar Memorial on Tuesday, there were deposited in an urn photographs both of the Memorial and of the recently demolished Bar, pictures that the *Daily News* hopes "have been executed by the most permanent of 'permanent' processes." Certainly, if photographs are in future to be put with coins of the realm, newspapers, and other records usually deposited with foundation stones, they should be of the most lasting character; indeed, only pictures burnt-in upon enamel or porcelain ought to find a place in such depositories.

Referring to the remarks on new emulsions in our issue of 30th July, Dr. Vogel writes to us that he now prepares emulsion of the same sensibility as the best plates of Wratten and Wainwright, and that his plates dry, after fixing and washing, in a few minutes. Dr. Eder, in a short notice in the *Photographische Correspondenz* for July, says that one great advantage of Vogel's emulsion is, that, even after long continued development, the brighter parts of the picture do not become too hard (as in the case of long developed gelatine plates), but remain soft and harmonious. For this reason, as Dr. Vogel asserts, clouds in landscapes are easily obtained with his emulsion. Another quality, Dr. Eder remarks, is that Vogel's plates, when dry, can be easily retouched with lead pencil, even before varnishing.

When collodion emulsion came into general use some years ago, several photo-chemists experimented with stained films, employing for the most part chlorophyl and eosine, in order to secure plates of a green and reddish hue, and with these pictures of the solar spectrum were secured. It was averred by some that films so tinted were impressed by certain regions of the spectrum that were without action upon non-tinted plates, while other experimentalists, again, maintained that it was simply the bromide or particular condition of the bromide in the collodion that accounted for the phenomenon. Gelatine plates may be easily tinted, and it is now suggested that films should be coloured, for the purpose, if possible, of permitting their development under less rigorous conditions than at present. How a film can be so tinted as to protect it from light during development, and still have its photographic properties unimpaired, is a problem, however, that has yet to be solved.

Eosine, the red dye stuff which has been most favoured by photographers in this connection, was employed, it may be mentioned, to decide a vexed geographical controversy some years ago. The most minute trace of eosine in water may be detected by its fluorescence, and for this reason the pigment was chosen to settle the question whether or no a certain stream was a tributary of the Danube. A large quantity of the material was thrown into the river near its source, and then at the spot in dispute the water was tested. This was found to exhibit distinct fluorescence, proof positive of the stream being the same as that which received the eosine.

M. Yvon, the French artist who is to give us a panorama of Ulundi painted from magnified photographs of Zululand, is an adept at battle pieces and at the art of employing the camera in combination with the palette. A picture of Solferino, with the late Emperor of the French in the thickest of the fray, is one of his most successful attempts, photography having been employed both in securing the portraits of the generals and the surrounding country. Battle pieces must ever be imaginary to a great degree, but it is as well to get as much truth in them as possible, and by combining the brush and the sensitive plate, artists are in a position to depict the real thing, at any rate, as far as they can.

This battle of Solferino picture of M. Yvon gave rise to a dispute as to the proprietorship of the negative, which went to the Paris Law Courts for settlement. It was chiefly over the portrait of the Emperor that the quarrel was raised, MM. Bisson frères, the well known photographers, claiming the negative as their property, and M. Yvon declaring the photograph to be his. Not wishing to take up the time of his imperial sitter, M. Yvon had decided to take a photograph of the Emperor at the Tuileries, posed on a suitable framework, as if on horseback, and from this peaceful position Napoleon III. was to be translated into the middle of the battle picture. MM. Bisson frères were commissioned to take the negative, and this was successfully done, and copies supplied to M. Yvon.

But M. Yvon claimed the negative as well as the copies. And for this reason. He proved before the Court that it was he who constructed the frame-work, posed the model, superintended the lighting, and gave directions as to the placing of the camera. In a word, M. Yvon stated that he managed matters as if he himself had been the photographer, and carried out all the work save and except the coating and development of the plate. In these circumstances he was adjudged the owner of the negative, but only on payment of three hundred francs to MM. Bisson frères, who had, of course, exercised unusual care and skill in the production of so important a negative.

Let us hope that M. Yvon may have no dispute over the Zululand negatives. Since these will not be taken under his own eye, he can put forward no such claim as that in the case of the Battle of Solferino picture. We do not know how he proposes to get portraits on horse-back of Lord Chelmsford and Evelyn Wood, but he will have hard work, we think, to induce these gentlemen to be photographed "a cock-horse" in their own drawing rooms. But if they do consent, there is little chance of a dispute over the proprietorship of the negatives; a British general would hardly like a photograph of himself posed in this position to be banded about or bartered. He would probably insist on its destruction immediately it had served the purpose for which it was taken.

Topics of the Day.

WITH THE CAMERA IN THE ISLE OF WIGHT.

BY JOHN SPILLER, F.C.S.

Perhaps no better topic can be suggested than the practical experiences of a tour with dry-plates undertaken in circumstances more favourable to us than were possible two seasons ago. The new system of photography offers so many facilities to tourists, that I venture to predict that many will take the camera with them now who hardly cared to be troubled with the older impedimenta; there is a measure of certainty in working with gelatino-bromide which amply repays one for the slight addition to the traveller's luggage.

Starting from London with the most portable form of camera and two dozen gelatine plates $7\frac{1}{2}$ by 5, I have returned home to develop my pictures, and am truly astonished to find how large a proportion of successes have rewarded my exertions. Plate after plate furnishes a fine negative, and my doubts about the length of exposure have been set at rest in the most gratifying manner. By giving a full time, never less than three seconds, with Dallmeyer's rapid rectilinear lens, and No. 2 or No. 3 stop, I never wanted an instantaneous shutter, but managed my exposures by hand, and having much to do with foliage, and working often in secluded places (as in Shanklin Chine and the Landslip), the time given has sometimes run on to twelve or fifteen seconds without showing any evidence of over-exposure. I claim to be the first to take a new view in the Chine, for on Sunday night, 4th ultimo, a great tree fell over, and this, constituting a most picturesque object, was duly photographed on the following day. My plates are not yet all developed, and amongst those in embryo, I believe I have a fair representation of the Carisbrooke Donkey, who gave me an unmoved pose of nearly three seconds in bright sunshine, and standing beneath King Charles' window. We had some trouble with "Jack," whose nerves had been recently shaken by a voluntary ascent to the top of the Castle Keep, and an involuntary descent lashed to a hurdle and planks a few days later. His keeper had by this circumstance somewhat lost his command over him, and a kindly appeal to the donkey was followed, as usual, by a retrograde movement; and when, later, we succeeded in gaining his attention, he made off to the well as the only recognised sphere of duty. However, we took him at last unawares, and let us hope the portrait will be truo to life.

After taking tha Smuggler's Cave, and a very curious example of hawthorn and ivy intertwined in the Landslip, my attention was suddenly directed to a very fine subject, which has so far given me my finest negative. It is "Her Majesty's" steam tug lying at anchor on a calm sea off Luccombe, and figuring in a gap between the groups of foliage (every leaf visible) in a most artistic position. The Luccombe Cliffs made another good picture, and the cottage close by proves almost as good a subject. The German band which, in full blast, recently gave Mr. England so happy a result at Notting Hill, last week moved to Ventnor, and, I grieve to say, "blasted" my best efforts to get a picture near that beautiful spot, for I was just ready to expose when bandsman No. 1 came to view, followed by stragglers in skirmishing order, and when the whole dozen had passed me the glorious sunshine had passed away also, and I had to wait nearly a full hour for another opportunity of uncapping my lens. Of course, here is evidence of the want of greater rapidity, which would have served me well on a few other occasions when the wind was blowing; but if we work with a comparatively long-focus lens, well stopped down to give good definition over the whole field, instantaneous exposures are almost impossible with these shaded subjects.

A few words about changing the plates. By a lucky

circumstance all the blinds at my apartments were of "red union," so that at night I had only to place the candles next the window, bring the curtain forward, and screen off side rays, to give me exactly what I wanted for conducting this operation. I had no need to trouble the local photographers or light my own "danger lamp," and the result proves that my confidence was not misplaced, for not one of my pictures so far is fogged, the darkest shadows being perfectly clear glass. I am reserving a few plates to try with ferrous oxalate development, but have succeeded well with pyrogallic acid and ammonia, taking care to moisten the plate well with the alkali and bromide before adding the organic pyrogallic, and proceeding very slowly with the development. It has been truly said that we cannot give local intensity in working up gelatine plates; but, on the other hand, Mr. J. Milman Brown, of Shanklin, showed me an exceedingly interesting example of reducing over-intensity by the local application of cyanide of potassium applied in strong solution to the film with a camel's hair brush. A negative which he took recently in Brading Church had the window over the tombs of the Oglanders quite solarized, but by proceeding in this manner he has certainly secured a first-rate result, as proved by the prints now in my possession. I have not found it necessary to blacken the backs of the plates, neither have the tiny gummed labels affixed for numbering, although quite white, had the least effect in reflecting back the light to the face of the plate.

Only one concluding remark to the effect that the best view of the pond at Bonchurch, and a succession of beautiful studies in the Old Church Road, at Shanklin, are now quite spoiled for the camera by the march of civilization, as manifested by the erection of gas posts, which it is found impossible to ignore in the picture. This reminds me to say that on this road, and close to the church, is a group of lime trees and appropriate background, which might have served Mr. G. H. Boughton, A.R.A., for his famous picture styled "The Waning of the Honeymoon." In portraiture, I took only one family group, and this turned out to be quite on a par with a wet plate negative—exposure eight seconds with the X stop, which is nearly full aperture. Amongst the subjects neglected I ought to have taken the station-mistress at Blackwater, and pointswoman at Alverstone, on the Newport Junction Railway; also the combined booking-office and waiting-room formed out of an old third-class carriage without wheels, which is just now in charge of the aforesaid lady official. All these would have been well worth the plate had not my stock been so limited.

The "Topic" for next week will be "The Panel Portrait," by Gilbert Fane.

OMNIUM GATHERUM.

BY CAPT. FRANCIS TURTON, R.N.

A gentleman ing from India, writes me in reference to some points in an article of mine in your paper of May 21st. I thought that perhaps some of the matters he alluded to might be of interest to some of your readers, and some information of value might be extracted from his queries. This gentleman tells me he has tried eight different sorts of sensitised paper, but none reached him fit for use but one which was packed as a roll, and which he had had for four years, and uses occasionally to take test prints from negatives; but that he can do nothing further with the paper, as it spoils on the touch of water, and resolves itself into "chocolate" at once.

He then asks about Durand's sensitized paper, which I have used for ten years, and found so very good as to keeping and sensitiveness. This he seems not to have tried. It is (after Carrier's) the first and best known of all ready sensitised papers. Mr. Durand writes me that for India he always sends it enclosed in tin. I have no experience of India photographically, although I served on that station for four years in one of Her Majesty's frigates many years ago. But certainly the experience of photographers who use gelatine plates and ready-sensitized paper and suchlike modern wonders of photography in India should be of interest to all who take interest in the advance of photography. This gentleman wishes the paper to be sent out *flat*, and it would seem certainly better if it could be done so, though the expense would be greater. I have kept Durand's paper for more than a year in a pressure-frame flat, and got good prints afterwards, though a little slow to work and discoloured when printed, but quite recovering the purity of white tones after the toning and fixing bath. I must candidly say that I have tried several sensitized papers, but have found none yet print so quick, tone so rapidly and well, or keep so long good, as the paper I have alluded to.

I wish Mr. Durand would give us some paper for *plain paper printing*; but he tells me his process is not adapted for that. Your paper of last week alludes to "Instantaneous Photography on Paper," in the "Talk in the Studio" column. This is about what we want now; who will supply this paper for the market? For amateurs it is the very thing.

I enclose for your inspection two prints sent me by this gentleman; they are of interest in his neighbourhood—the remains of a fine temple.

He asks a question as to "unvarnishing" a plate. I find that gelatine plates can be unvarnished well by soaking in alcohol (methylated), and a tuft of cotton-wool can be applied to the surface to aid removal if done with care, and the plates can be intensified afterwards.

My Indian friend asks about Warnerke's tissue and roller slide. Therefore, Mr. Editor, can you give him the best information, as all readers of the News three or four years ago remember Mr. Baden Pritchard's pleasant papers with Warnerke's roller slide in the Tyrol, which I for one read at the time with much interest.

I would strongly recommend this gentleman to try some gelatine dry plates of Bennett's or Mawdsley's, and especially some of the Liverpool washed emulsion. Only last week I again tried some washed emulsion I had from Mr. Mawdsley more than five years ago, and found it excellent. I used a substratum of india-rubber of Mr. Russell Gordon's formula with it, and intensified the plate afterwards with the mercury and ammonia intensifier, which acted quite well, as with a gelatine plate. Those who use collodion emulsion must, however, take care to tie down their corks, or they will find some morning nothing but a button of silver for their creamy emulsion quietly reposing at the bottom of the bottle. If this collodion emulsion were only more rapid, gelatine plates and emulsion would be out of the market, for nothing can beat this emulsion for general ease, simplicity, and utility of working results.

I have just been trying some new gelatine plates issued by the Photographic Artists' Co-operative Supply Association; they are very rapid, but the films a little tender, which defect can be remedied by edging with varnish before development.

PURE WHITES IN PHOTOGRAPHY.

BY FRANK THOMAS.*

One of the first requisites to good prints, after a good negative, is good paper and a good silver solution. Most of the paper now-a-days will work if it is handled just right, and prints can be made on any silver bath, but the one I have found to be the best is made as follows:—Make a solution of nitrate of silver in water up to the required strength, and render it perfectly neutral. Then to each ounce of solution add two grains of nitrate of potash; shake thoroughly.

* From *Philadelphia Photographer.*

Pour out enough of this solution into a graduate, so that it will contain three or four grains to the ounce of that left in the stock-bottle. Say you have sixty ounces at fifty grains to the ounce: four ounces of the stock solution will contain 200 grains of silver, and there will be between three and four grains to each ounce remaining in the stock-bottle. Now to this four ounces add of a saturated solution of salt enough to precipitate all the silver in the four ounces. When precipitation is complete, let settle. Pour off the liquid, and thoroughly wash the precipitate, and add to the remaining fifty-six ounces in stock-bottle. Never use less than three grains of chloride to the ounce, and more will do no harm. Shake the whole well together, and add one ounce of pure glycerine to every twelve ounces of solution, and set in the sun until the precipitate is well darkened, occasionally shaking or stirring, so as to bring the whole mass under the action of the light. When the darkening process is accomplished, the clear solution is ready for use, and is undoubtedly the purest silver solution made. Do not neutralise the solution after the addition of the chloride. After using, always pour back into the stock-bottle, and set in the sun. If it refuses to clear up, add fresh chloride, and replace in the sun, and it will be all right.

Should it, after long use, get saturated with albumen, decant the clear part into the evaporating-dish, and evaporate down to one-third. Let cool; then pour out into stone-china saucers or an agate iron pan (never use a porcelain evaporating-dish unless you wish to reduce its size), and add an equal amount of alcohol (95 per cent.), and set on fire. Do this away from all draught, and it will burn about three minutes, and will precipitate all the albumen in the shape of a curd. Now reduce to 50 grains, add fresh chloride, not less than three grains to the ounce, and set in the sun to darken, and when the chloride is thoroughly darkened, your solution is ready for use. Float your paper from one to two minutes, draw over a glass rod or the edge of a dish, if smooth, and blot off all surplus silver, and then dry quickly. Fume from ten to thirty minutes, according to the size of the box and the atmosphere.

Now that we have a reliable silver bath, and our prints are all made, we will proceed to wash and tone. Run the prints through two changes of water, and then let them remain in acid water fifteen to twenty minutes, keeping them well stirred all the time (acid water, 6 drachms of acetic acid No. 8 to 1 gallon of water). Then quickly and thoroughly wash in six to eight changes of water, and they are ready to tone.

Toning bath as follows: (Make a saturated solution of borax in cold water):

Saturated solution of borax ...	1 ounce
Water	6 ounces
Bicarbonate of soda	10 grains
Salt	10 ,,
Gold, sufficient to tone	

Put the gold in first, then the borax, soda, water, and salt. Tone until the high-lights are about what you want when finished; then place in clear water.

Fixing solution: Keep on hand a saturated solution of hyposulphite of soda, and make your fixing bath 1 ounce of saturated solution of hypo to six ounces of water. Make alkaline with bicarbonate of soda.

Now for the secret of pure whites, and the only way you can get them pure. Procure your half ounce of aniline blue, letter I, and dissolve it in 16 ounces of water. When your fixing bath is made up, add from 15 to 20 drops of the blue to every 40 ounces of fixing bath. Fix your prints from twelve to fifteen minutes, and remove to a strong solution of salt and water. Let them remain five minutes, and then gradually dilute with fresh water, so that the change of temperature will not be so sudden, and you will never be troubled with blisters, and will always have pure whites.

There are plenty of formulæ published, but few who give them any instructions whatever, consequently so many fail to get any good of them. The quantities are given, but the proper mode of mixing is left out.

Now, brother photographers, give us your formulæ, but give us full directions as well as quantities, and we will succeed much better. Take, for instance, a formula for collodion composed of iodide of potassium, iodide of cadmium, and bromide of cadmium, "no instructions." Can any one dissolve these three salts in alcohol? I say no; they will use water for the potassium. But they can be dissolved in alcohol by first grinding or pulverizing the potassium, then the bromide of cadmium until quite fluid, and then the iodide of cadmium until the whole is quite pasty, when all will very readily dissolve in alcohol without any precipitation.

Correspondence.

PRECISION IN STATING FORMULÆ.

Sir,—My object in writing this is to request that all who have formulæ put into print should give them in as simple a form as possible, so that we could put them to trial without losing valuable time. I very often try a dodge that I see in your valuable paper, and have found the benefit in certain instances; but there are others, perhaps, besides myself who do not mind forfeiting a trifle to learn something new, but strongly object to lose both time and money unnecessarily. My case is simply this.

No. 1.—I saw Dr. Eder's formula for dry plates—sent and got the potash—spent hours altogether in trying to dissolve it. There is half of it remaining now, and it was made weeks ago. It seems ridiculous to me to state two ounces, when it will not take up more than one. I thought it all ought to go, so spent a deal of time in trying the new developer.

No. 2.—A formula recommended for varnish, three ounces white lac, &c., taken according to instructions, but there the lac remains. I have tried heat, but no good.

No. 3.—On the printed forms from the various dry-plate firms, bichloride of mercury one ounce to twenty of water is recommended for intensification. I sent at once to the chemist for it, but was informed it would not dissolve except in hydrochloric acid. So there again I was brought to a full stop.

Now, I say formulæ certainly ought to be stated simply and distinctly, so that all, clever and foolish, could go and make any recommended compound at a minute's notice.

Excuse my intruding on your valuable space, and if you or others can inform me how to get out of my difficulties, your humble servant will feel obliged.—Yours respectfully,

A Subscriber for Many Years.

[There is much truth in our correspondent's letter, but does he not lay himself open to the same charge when he speaks of "potash" being used in Dr. Eder's new developer? If this is intended to mean *oxalate of potash* there is a host of testimony from Mr. C. D. Davies, Mr. York, and others, showing the quantity of neutral oxalate of potash which can be dissolved in distilled water. Of course, if the water be impure there is always a residuum of oxalate of lime Our correspondent has been misinformed as to the solubility of bichloride of mercury, but if he adopts Mr. England's recommendation, and adds one ounce of chloride of ammonium to the above proportions, his difficulty will vanish.—[Ed. P. N.]

A NEW STANDARD FOR STUDIO EXPOSURES.

Sir,—Like Mr. Spiller, it occurred to me some time ago to use Crookes' radiometer for timing exposures; but on going into the matter I found that the instrument is unfortunately affected by heat as well as by light, hence

totally unreliable. Besides, unless the vanes were much larger it would be too trying to the eyes to count the number of revolutions.

I have found an admirable "exposure regulator" in Maelzel's metronome. As well known to most of your readers, it is an instrument used to beat time in music. By adjusting the regulator to sixty on the graduated scale you get one beat per second. As a loud "click" is given at each beat, the time can be accurately determined by the ear. The "click" is plainly audible even at a distance of forty to fifty feet, so it is not necessary to have the instrument in the studio at all.

I find one beat per second the most convenient for studio work, but those who desire two or three beats per second have only to slide the regulator to Nos. 120 and 180 respectively. Thus it is easy to time an exposure to one-third of a second. This will be appreciated by those who use instantaneous shutters.

If during exposure a cloud happens to pass, allow a few more beats.

If the intensity of the light be fairly constant, Mr. Warnerke's sensitometer may be used advantageously in conjunction with the metronome, the number of beats to be allowed to be regulated by the intensity of the light.

The cost of an ordinary metronome is from 12s. to 15s., or, with bell to ring at the second, fourth, or sixth beat, £1.—Yours faithfully, C. Minora.

PHOTOGRAPHIC WRINKLES.

Sir,—In a recent number of your journal I observed the suggestion of using a mirror when taking a picture of a corpse; this wrinkle has been in use in the States for many years. It is also generally practised in making copies of old photographs; it is found to be of great service in copying Daguerreotypes. Indeed, I have rarely seen a copy made in America without the mirror being flashed on to the picture to be copied, but I do not know whether it is in general use in England.

With regard to the method of printing cracked plates, as mentioned in your last number, in use by Mr. Mayall, a somewhat similar plan of printing cracked negatives has also been long in use on the other side of the Atlantic; they there use string merely to support the printing-frame, as bottle-jacks are unknown in America, owing to the use of closed stoves. The meats are all baked, and a roast joint seldom seen; hence, a bottle-jack would be looked upon as a great curiosity by the untravelled Yankee. The exportation of a cargo of bottle-jacks might be a good thing, as they would doubtless be soon disposed of amongst the large photographers of the States.

Pray do not let me take up too great space, but I cannot help noticing your paragraph in the "Notes" of a recent issue, viz., the use of gelatine plates in America. I cut that out, and forwarded it to the manager of a large studio in New York, and await a reply; but I fancy one reason why the Yanks. are behind us in the new process is because the light being normally better in all parts of America, the exposure is always less than in England; hence there is not the extreme desirability of obtaining ultra-sensitiveness to shorten exposure. Another reason will, I think, be found to militate against the use of gelatine in America, and that is the extreme heat during the summer months, necessitating, as it does, with the present wet process, the use of ice in all dark rooms there. From what I have seen of America and Americans, they amble along together at a very comfortable pace, which is sometimes better than taking a long stride to step in a puddle.—I remain, your respectfully,

Photos.

THE SILVER BATH.

Dear Sir,—I think the thanks of many in the profession are due to Mr. Blanchard for his kindness in publishing his excellent method of making and managing the negative bath.* I have expected every week to see a letter from some one, acknowledging, as it ought to be acknowledged, the kindness of many such eminent gentlemen in the profession, who, instead of keeping such valuable information to themselves, kindly give it to those who need it most. I mean the large number of photographers who have to work on from day's end to day's end, and who have hardly time to grapple with the inevitable troubles, and are without time, or perhaps ability, to solve intricate chemical problems.

Having tried the method as published, I found it yield most satisfactory results; it gives you always the negatives one could only get sometimes, and since using it work has been a pleasure. I do not believe such negatives are possible by any dry process known at present.

But here I must stop. On trying to renovate the used-up bath, I have met with decided failure; the negatives are hard, and want detail in the shadows, and the bath works much slower, and I write to ask him to give me kindly a method of converting the used-up bath into solution for the printer that will yield good prints; if that can be done, the photographer could revel in a succession of beautiful new baths.—Yours very respectfully, A Poor Photo.

* See Photographic News, May 7th.

Talk in the Studio.

Photographic Actions. — At the Metropolitan County Court of Bloomsbury, on Friday last, the case of Seymour *v.* Stevens was heard, in which the plaintiff, a photographer, of the Euston Road, sued the defendant to recover the sum of £2 odd, being for photographing the tomb of the defendant's late wife. It appeared, from the statement of the plaintiff (for whom Mr. Thomas appeared as counsel), that on the first proof of the photograph being sent to the defendant, he objected to it, and wished to have some of his relatives included in the photograph, and consequently the plaintiff was put to the trouble and expense of taking a second negative, of which proofs were sent to the defendant, and application made for payment, when the defendant again objected, and refused payment. Hence the present action. The defendant said he objected to the second photograph on the ground that the picture was too crowded, and that the relatives in the foreground obscured a view of the greater part of the tomb. The plaintiff said that it was impossible to avoid this. The defendant himself selected the size of the plate, and suggested the position of his friends in the picture, and the defendant's instructions had been carried out to the letter. The learned Judge considered the photograph in Court a very good one, and ruled in favour of the plaintiff for the full amount claimed, with cost of counsel and solicitor.——*Robinson v. Condon.*—William Robinson, schoolmaster, Brough, sued Arthur Condon, photographic artist, for the sum of 18s. for breach of contract. Plaintiff stated that defendant undertook to supply him with photographs of the children attending his school. When the photographs came to hand they were imperfect, and not saleable. He wrote to defendant to that effect, in reply to which he stated that he would compromise the matter either by taking the photographs back, or re-taking the children. His Honour: The question is, are they reasonably good? Defendant: Yes, your Honour, they are; but of course you must bear in mind that you can't take good photographs individually of such a large number of children. Plaintiff stated that the photographs were taken out of doors. Defendant had his own choice of time, position, and background. His Honour (looking at a copy of the photograph): That is you in the background? Plaintiff: Yes, your Honour, it is. His Honour: Well, it is very good. I don't think they are so bad for out-door photographs. Plaintiff: I have shown them to some of the parents, and they fail to recognise their own children. Defendant: You must be mistaken, as I have sold several copies of them since I took them. His Honour (to plaintiff): Well, your own photograph is very good. At the same time, the likenesses are very small. Defendant: Yes, your Honour; of course they are not life-size. Plaintiff: I bought a number of these photo-

graphs to sell at 6d. each to the parents of the children; but I couldn't get them sold owing to the indistinct manner in which they had been taken. Defendant here read an extract from an article in the Photographic News of July 31st, which strongly advocated the principle, which he universally adopted, of obtaining payment for taking photographs in advance. His Honour (to defendant): Will you take anything less for them than 6d. each? Defendant: No, your Honour. I have done my utmost in the matter, and the photographs are as good as I could make them. Plaintiff: They are not so good, your Honour, as the copies which he showed to me when he came to ask me if I would have the scholars taken. His Honour (to defendant): Have you any of these copies which you showed to plaintiff with you? Defendant: No, your Honour, I have not any by me; but I can vouch that those which I took were quite as good as any which I showed plaintiff. When I let him see a proof of the photographs, he expressed his satisfaction, and ordered ten dozen copies. His Honour: I confess that anyone would recognise their children on these photographs. Plaintiff: There are some small children in the front quite unrecognisable. His Honour: Oh, dear no. Those in front appear to me to be quite recognisable. The photographs are, on the whole, very good; but do you mean to say you have paid for these photographs? Plaintiff: Yes, your Honour. His Honour: And you are now trying to get 15s. back. What nonsense! Why did you pay for them at first? Plaintiff: Because those were his terms. His Honour: To be paid in advance? Plaintiff: Yes, your Honour. His Honour gave a verdict for defendant without costs.—*Penrith Observer*.

Fire at a Photographer's.—On Monday last a fire, resulting in serious injury to two persons, took place at 31, Spa Road, Bermondsey, in the occupancy of Mr. E. J. Cooper, photographer and picture-frame maker. The outbreak was occasioned by some tar boiling over in the rear of the premises. Mr. Cooper, who was sitting in the back parlour at the time, fearing for the safety of a young man, known to be in an adjacent out-building, rushed through the flames to save him, but unfortunately slipped and fell amidst the fire. The wife was a witness to the misfortune of her husband, and, in her endeavours to afford him aid, she also became a victim. It was found that Mr. Cooper, whose age was 31 years, was severely burned about the face, legs, and arms; and his wife, Frances Cooper, aged 28 years, sustained serious injuries about the face and hands. Both of the sufferers were conveyed to Guy's Hospital. The contents of the place were insured in the Atlas, and the building in the Sun Office.

Fallacies of Photography.—It is a prevalent notion that a photograph must necessarily, from the very nature of its production, be truthful in every detail to the object upon which the lens has been directed. So far from this being the case, there is really scarcely any limit to the amount of exaggeration and distortion which may be, legitimately or otherwise, introduced. The popular belief in the infallibility of the camera is, like many other popular beliefs, fallacious. By the aid of a common lead pencil, the wrinkles, furrows, and crabbed outlines of age can be quickly and easily removed from the face, leaving it as fair, round, and innocent of shadow as the countenance of a marble statue. A stern virago of sixty may, after an hour's labour on the negative by a skilful "retoucher," be transformed into a sprightly matron of thirty. In flattering the "human face divine," the operator has perhaps greater facilities than a painter. A fat person may be made slimmer, and a thin one stouter; age and youth reversed. Sometimes the very fidelity of photography, however much of a paradox it may sound, causes it to exaggerate. Rays of light affect the sensitive plate according to their intensity. Thus, a white shirt-collar would give an impression quicker than the face, which is darker in proportion. Now, suppose the face to be tanned or freckled, the tan marks being of a yellow tinge—which is even less "actinic" than a black coat—would give the photograph, if allowed to go "unretouched," the appearance of the face of the unfortunate "sitter" having been sprinkled with a pepper-box. I merely offer this instance as a prominent one of the manner in which the strict adherence of the photograph to the power which creates it—light—causes it to distort. Furrows, wrinkles, all marks of age and thought, give deeper shades than the eye can detect when gazing on the living face. The unerring penetration of the sensitive plate, in these instances, gives the subject as it is, and often different from the view of it by the eye. According to the skill and taste of the artist, so does his work approach our conception of the original.—*Leisure Hour*.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, "*Photographic News*" *Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed* "*Union Bank, Photographic News Account.*"

Lens.—Make your question a little more definite, and say what size portrait you desire; you probably mean the panel or promenade.

Novice.—Use a weak developer, and, after fixing, flow over the plate a solution of—

Bichloride of mercury	12 grains
Water	1 ounce

Studio.—You will find it in "Hardwick's Manual of Photographic Chemistry."

K. R.—The defect would disappear if you used a smaller stop.

C. Frautus.—If you write to the maker you are certain to get the desired information.

Richard Huck.—Thank you; the pictures you send are very pleasing. A little more richness or depth in the shadows would have added to the result, but this could only be secured in fine weather, when you have command of sunshine and cloud. Both are fully exposed.

John Terras.—We generally employ canvas-backed paper, which is easily pieced together if necessary, and may be manipulated without difficulty. It is not difficult to obtain if you go to any dealer in artist's or drawing materials.

B. B.—About five pounds, we believe; Mr. Laws will doubtless give the information next week.

W. Brodripp.—1. See above. 2. Next week.

South Devon.—Try Mawson and Swan. Captain Turton's letter was in News of July 2.

Photo.—The Autotype Company would surely undertake the work.

J. H. Radforde.—A good deal of experience is necessary, unless you are something of a photographic chemist, to prepare an emulsion which is both sensitive and clean in its working. See Mr. Bedford's instructions in Photographic News for 30th April; they are clear and to the point. The addition of ammonia will give sensitiveness, but it must be used with considerable caution.

J. Kay.—Try Newman, 24, Soho Square.

J. S.—You can purchase the Copyright Act of Messrs. Eyre and Spottiswood, Queen's Printers; our copy is dated 1876.

H. Lyon.—Your best plan is to take England's formula given in the "At Home" in the News for April 9.

F. Rogers.—See our leader in News of April 2, and "At Home" at Williams and Mayland in No. of March 5. We cannot understand your non-success with the "medium." M. Bassano employs a 4H or 5H pencil, but with the "medium" so hard a point is unnecessary. The only difficulty we have found is in protecting the retouch afterwards. Send us a letter for insertion if you do not succeed.

Mc Keon.—We will write and ask the question for you. The firm is a very respectable one, and there must surely be a misunderstanding.

W. L.—We will write as you request, and let you know next week.

Gordon.—You are right in your assumption; it is the same under another name.

H. Grayson.—They are due to foreign particles of some kind, either dust upon the plates, or dregs in the collodion. Analogous markings are well known in the ordinary collodion process.

Nuts on the Lime Bath.—"Sir,—I be a young farmer, and thinking I should like some picturs of our turmits and mangle wurzels, I have got a photographic machine and all belonging to it to make my own picturs, and I takes in your newspaper, what I reads with my pipe on a Sunday afternoon, and I were pleased with summat I read to-day about toning with lime—cos I have a lime quarry on my farm, which I can always get at, whereas them sodas have to be got at the doctors' shops in market town. So I were pleased to see in your newspaper of last week summat about lime toning by some genelman named Blanchard. But one thing puzzels me—what nut does he mean when he writes about whiting being put into the jug about the size of a nut? Them coker nuts which are shyed at at our fair are big ones, and the hazel nut is a small one. I want to know which, cos I don't want to whitewash my turmits too much, so perhaps you will ask him to give the nut a name, and let me know in your newspaper next week, and oblige, yours truly, Jeremiah Hodge."—[Mr. Blanchard's nut, like any other, should be taken "with a pinch of salt." Our correspondent is evidently puzzled, as well he may be; possibly, he has been looking up koker nut in Nuttall's dictionary, or perhaps putting his own nut into a jug to see how he likes it. Our advice would be to take the common British nut, neither cob, nor wall, nor cocoa as a standard, at any rate to begin with.—Ed. P. N.]

The Photographic News, August 20, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photographic Enamels—A Photographic Action.

Photographic Enamels.—It is a pity that photographers do not turn their attention more to vitrified photographs than they do. As Mr. H. N. White pointed out in a paper read some three months ago before the Bristol and West of England Society, the first-class dealers in porcelain are beginning to supply material, yet in all England the photographers who will undertake the work scarcely amount to a dozen. The secrecy which surrounded M. Lafon de Camarsac's process, the earliest in the field, probably gave to photographic enamels a mystery which deterred many from experimenting; but now that excellent porcelain pictures have been exhibited by workers other than M. de Camarsac, there is no reason why photographers generally should not interest themselves in their production. Since Mr. White read his paper, which contained a fairly complete account of all that had been done by previous workers, a new process has been patented by M. Lemary, of Paris, which differs in many material points from those already in use, and for which he claims the power of ensuring absolutely the colour which the artist wishes to produce. Hitherto, it is stated, perfect results have been difficult to obtain, mainly because the photographic process destroys the balance of the colour fluxes, which can never be restored with certainty. Hence the colours adhere but slightly or not at all to the porcelain or earthenware, and there is a partial or entire absence of glaze and development of colour which are essential to the good appearance of the photograph. In fact, if the balance of the fluxes be destroyed by the operation, and if at certain parts tints due to more or less fusible oxides be added, a portion of the photograph will be destroyed at some parts, and changed at others, and the colour will not be developed at all at certain places. The object, then, of the invention is first to restore to the colour the balance of the fluxes, and secondly to modulate the colours by the photograph instead of covering the latter with the colour. This is sought to be carried out in the first instance by pouring upon a carefully-cleaned glass plate the following sensitized composition, the relative proportions being varied according to the season:—Manna, 10 grammes (154 grains); dextrine, 5 grammes (77 grains), dissolved in distilled water, 40 cubic centimetres (617 grains). Bichromate of potash, dissolved to saturation in distilled water, 60 cubic centimetres (926 grains). After the plate is coated it is dried by heat, exposed in a printing frame under a positive, and developed in the dark room with pure oxides, that is to say, without fluxes, of cobalt and iron mixed with a little yellow for porcelain, and grey colour for earthenware. The flux for the colour to be employed is finely ground by means of a muller with pure glycerine, and then diluted until sufficiently liquid, and this mixture is then added to 100 grammes of normal collodion at 1 per cent., shaken up in a bottle, and filtered through a fine cloth. After having poured the above composition on the plate, and allowed the collodion the necessary time to dry, the plate is first dipped in water, and then in a bath of carbonate of soda at from 25 to 30 per cent., and then again washed in plain water, after which the film, which separates readily from the glass, is transferred (with the collodion side uppermost) on to a sheet of prepared paper. This paper is prepared in the following manner:—Dissolve over a slow fire a quantity of virgin wax—spermaceti, stearine, or other analogous substance—in about three times its weight of spirits of turpentine, or other spirit or oils. After the composition is sufficiently cooled, it is rubbed with a pad as evenly as possible upon the white paper until sufficiently coated. Upon this coated surface the film before mentioned is, on leaving the water, to be floated or deposited with the collodion side uppermost, and after draining it is to be pressed between two sheets of blotting-paper, and when nearly dry a thin coat of spirit of turpentine is applied with a flat brush; it is then dried in the air or by a gentle heat. The photograph has now the appearance of an ordinary paper print except that it has not the same tint, and when dry it is coloured to the ordinary ceramic colours, and allowed to evaporate afresh even in the open air or at a gentle heat. The photograph can now be transferred to the surface to be ornamented, for which purpose the surface is first heated, and then receives a coat of fat spirit of turpentine at the part where the photograph is to be applied. The photograph when the turpentine has set is applied with heat and made to adhere well at all parts, after which the paper can be readily peeled off. The porcelain or earthenware is then dried well, and fired in an ordinary muffle. Mr. Lémary has also a modification of the above process to which we may allude at some future time.

A Photographic Action.—"Fit for the fire," is the opinion expressed by the Editor of the *Appleby and Kirkby Stephen Herald* upon some photographs which have recently been the subject of litigation at the Appleby County Court; while the plaintiff in the action, who desired that the photographer might refund the money paid for the pictures, said they were "wretchedly unartistic." Seeing that the plaintiff was a schoolmaster, we can only wonder that he should have been led into using such an "unartistic" expression; but it is not with the words so much as their meaning that we wish to deal. We gave our readers an account of the action last week taken from the *Penrith Observer*, and not the *Herald*, but the latter has now been forwarded us with copies of the pictures which led to the dispute, with a request that we, too, may express an opinion. It is rather late in the day to do so, seeing that beyond those above quoted, the judge at the County Court has also made known his ideas upon the subject. We may, however, be permitted to point out in the first place, touching the *Herald's* opinion, that a picture may be a very good one, and yet serve as a "pot-boiler"; while as to the charge of being "unartistic," it is difficult to see how a group of fifty-four boys and girls and teachers compressed into a carte picture could be otherwise. The charge made for taking the pictures was to be at the rate of six shillings a dozen, this to include the cost of taking the negative, and, under the circumstances, one would hardly expect very grand productions. But to resume. The photographer showed his specimens, and the schoolmaster approved them, paying eighteen shillings for three dozen prints. A negative was taken, and the copies supplied. The dispute now arose. The schoolmaster said the pictures were bad; the photographer contended they were good. The former wanted his money back; the latter would not refund it. The photographer supported his case with the plea that the plaintiff had actually seen the negative, and approved it. "I don't think they are so bad for out-door photographs," said the judge; and we say the same, after a careful examination of the prints. They are not so good, we frankly admit, as pictures which, no doubt, Mr. Robinson, of Tunbridge Wells, would turn out; but, then, Mr. Robinson and his peers want more than six shillings a dozen for their pictures. Again, compared to half-a-dozen specimens sent, the group holds its own very well, and when we say that the faces of forty out of the fifty children are really very sharply defined—to say nothing of a row of hobnailed boots, in which you might count the nails—most photographers would say that the result is certainly fair work for a carte lens to do. In the end, as we know, the judge gave a verdict for the photographer. "He thought the plaintiff unreasonable; the likenesses were reasonably good for out-door photography." We congratulate the photographer on the verdict, and also upon his good fortune in having a judge to try the case who knew something of the capacity of lenses, and was not ignorant of the differences between indoor and out-door portraiture.

At Home.

MR. JABEZ HUGHES AT REGINA HOUSE, RYDE.

The "regal establishment" of Mr. Hughes, its square white tower rising above the green trees of Ryde, is not unknown to many of our readers. The prominent site and elegant construction—a pile of Portland stone and pale brickwork—standing, as it were, on a pedestal in the middle of a bright little town, tell much for the position and emoluments of photography now-a-days; and approaching from the pier, one hardly knows which to admire more, the straight lofty fabric, or the idea of choosing such a beautiful spot as Ryde for its construction. The studio is built at the top of the green fringed hill upon which the town stands, and in consequence Mr. Jabez Hughes enjoys the unalloyed satisfaction that his light cannot be interfered with.

There is surely no credit in making pretty pictures in such a pretty spot, and we tell Mr. Hughes so. Look at those garden-bordered quays, and the sunlit waves dotted with yacht-sails that drive like snow-flakes over the blue water; see the delicate rigging of that big ironclad, "The Hercules," running down the Solent on her way to Portland to join the Channel Fleet, and far-off Osborne Point, covered with yellow-green foliage that seems to dip down to the water's edge. From here you can just see the twin towers of Osborne House rising above the woodland slope. Now turn round and look across over the strait at Portsmouth town, that lies lit up in the sunshine yonder, between the low green batteries by the harbour; and look, too, at the brown hills beyond, with great niches of white where the chalk quarries are. Glance your eye right and left at the azure sea, and the tiny black forts jutting out of the water like "beauty spots" upon the face of a blue-eyed belle. The Queen's photographer cannot help making beautiful pictures under such influences, we say, though 'tis true we once did hear of another reason why good photographs are taken at Ryde; it was given us by a mutual friend—no other than Mr. Toole, the comedian—and he told us it was because they got *Hughes* to it.

We walk up the street to the studio in company with our host, and enter the handsome reception room. Here is something of which the owner of Regina House may feel even more proud than of anything we have yet noticed. Every carte and cabinet picture is printed in carbon. Permanent pigments have ousted silver ones in Mr. Hughes' establishment, and the countless pictures in the show cases are all of them carbon prints. We believe Mr. Hughes is alone in being able to make the proud statement that here appears: "Every portrait is produced in permanent photography, and will never fade."

Mr. Hughes prints by a chromotype process of his own—if chromotype it can be called, when the prints are produced unglazed, and without a margin. In other words, the negative is not reversed, but printed upon carbon tissue, which is developed on collodionised glass. The opal plate is simply rubbed with French chalk before the collodion is applied, and then there is no difficulty about separating the latter when it comes to the transfer process. In the end, the glaze upon the surface is removed with moisture, and in this way carbon prints are secured quite equal, apparently, to those by the single transfer method.

"I have said I always employ permanent pigments in general work," said Mr. Hughes; "but that is not strictly true. I do print from my negatives with the fleeting silver process, but only the unfixed proofs supplied for approval. I may say, therefore, that I utilize in their proper sphere the fading as well as the permanent process." Mr. Hughes turns this preliminary printing in silver to further account, for it affords him a valuable criterion of the density of his negatives. He employs Durand's paper, which is very uniformly sensitive, and he knows that his carbon tissue will require just one-third the amount of printing that is necessary for albumenized paper. While on the subject of printing, Mr. Hughes also said a good word for platinotype, which he employs for special work, the results of which he likened in character to prints upon fine salted paper.

As to reticulation, we asked. Mr. Hughes would admit that he was sometimes troubled with this defect, but not frequently. There were two kinds, he said; one of a mechanical nature, which arose possibly from a tenderness of the gelatine, and which could, with care, be kept under control, the use of spirit being a very general remedy; the other was due to decomposition, and to cure that was impossible. He preferred keeping his carbon tissue two or three days after sensitizing; the results were then much more uniform and certain.

We have spoken hitherto of the general work, but Mr. Hughes has also a speciality in the shape of his large collodion transfers. Indeed, at Regina House, the usual order of things is reversed. While the small work is all printed in carbon, the large is done by collodion. Mr. Hughes assured us that for the past twelve years he has taken no portrait negative bigger than a cabinet; if larger pictures are desired, these are invariably produced by the collodion process. An upper studio at Regina House contains little else but enlarging cameras for this kind of work. There cannot be a simpler enlarging process, argued our host; the negative is simply placed in the camera, and an enlarged positive is taken, which is toned and worked up as required. In other processes you have a transparency to prepare and work up; from that you produce a negative, which must also be worked up; and, finally, when you have secured your prints, these have to be worked up into the bargain.

But we have meanwhile progressed no further than the reception room. We now pass on, glancing into the well-appointed dressing-rooms on our way to the forecourt of the glass room, all of which are on the ground floor, with a garden parallel with the studio. It is delightful to linger here, especially this hot summer's day. There are ferns and fresh ivy, and a plashing little fountain among the rock-work and greenery. Some rustic garden seats are at hand, and altogether the cool grotto-like aspect of the place is exceedingly pleasant. But we cannot afford to lose time, and enter the glass room. It is an apartment of handsome dimensions, measuring 35 feet by 20, and it is, moreover, some 18 feet high. Its size is the more striking from the fact that it is unencumbered with furniture. The lighting is North, and, as we see it now, the only illumination that enters is a high side light. Above is an ordinary ceiling, and no skylight at all; but inasmuch as the side wall, after rising some ten feet, slopes inwards towards the ceiling, and this slope is glazed, sufficient light comes in to give a soft, subdued illumination all over the apartment. This upper part of the side wall is covered in with dull glass of a greenish hue, known, we believe, as "Hartley's patent rolled," and in consequence there is no definite top light, as would certainly be the case if clear glass were employed instead. The lower part of this North side of the studio is also glazed, but at present screened with thick curtains, which are withdrawn in part after the sitter has taken his place. The light that enters from above is sufficient to illuminate the model over all; side light is then employed to give a definite effect, to point high lights, and to throw shadows. Not a ray of sunshine ever enters Mr. Hughes' studio, so admirably is it constructed, while, nevertheless, its illumination is so perfect that the most rapid exposures may be given. The full advantage of all this is realised when we remember that there is no puffing and blowing to climb to the top of the house, and no sweltering in a hot glass room when you arrive there, for Mr. Hughes' studio is in no sense a *glass* room; everything is cool and quiet, with a pleasant look-out on the garden through the large door-windows. The studio furniture is in every case

real. Tables and chairs are of solid oak, while couch and settee, with their mouse-coloured velvet coverings, are worthy of notice, if only because of the excellent carving upon them. In a picture they appear handsome, for the simple reason that they are handsome.

We next visit the dark-rooms, situated behind the studio, the distinguishing feature of which is their great height, for they, too, have an altitude of eighteen feet. Mr. Hughes has himself suffered so much from the effects of photographic vapours and fumes, that he determined, in the construction of Regina House, to make thorough ventilation one of its chief characteristics. A system of hot water pipes pervades the whole building, and it is only in dining and drawing-rooms that mantel-pieces and chimney-places are to be found. A hundredweight and a half of coal daily suffices by these means to warm twenty-five rooms.

We go upstairs to the printing rooms. The carbon tissue is sensitized here, the strength of the bichromate solution varying from three to five per cent., according to the density of the negative to print. The drying of the tissue is effected in a dark cupboard, from which the air is exhausted from below; the sheets hang upon laths radiating from a centre, which centre depends from a roasting jack, and is thus made to revolve. In this way the surfaces of the sheets are exposed freely to the air, and are uniformly dried. Here we see the gelatine process complete—gelatine negatives and gelatine prints under manipulation.

We pass to the upper studio, where collodion transfers are prepared. There is little here to tell. The collodion enlargement is projected on to a screen, the dark-room itself forming the camera, and, after development and fixing, toned with judgment *and* palladium. To judge of the extent of toning, the plate is turned over and examined from the back, for it is from this side, it must be borne in mind, that the print will eventually be viewed. After stripping, the film is usually covered with a bright or a matt varnish, and may then be touched little or much as circumstances dictate.

We descend to the mounting and retouching rooms, and the negative store-room, where countless plates, each packed in a paper envelope, are ranged in rows of pigeon-holes. "Billiard room at Osborne," "Queen's sitting room," "Drawing room," we read upon various packages, for every envelope bears outside the name of its negative. Here are the negatives of the Princess Fredrica and her husband, who have just been photographed in bridal attire "by command of Her Majesty," and here, too, are the pictures of Lord Beaconsfield and of his private secretary, Lord Rowton.

We may mention, in conclusion, the terms at Regina House for cabinet and carte pictures in carbon. The former are charged at the rate of a guinea and a half per dozen, and the latter at eighteen shillings. But Regina House does not make it a practice to issue a printed list of prices.

Our "At Home" next week will be "With Professor Lister, F.R.S., of King's College Hospital."

THE PREPARATION OF ENCAUSTIC PHOTOGRAPHS.*

Encaustic photographs can be produced in two ways: by the dusting-on process, and the substitution process. The first of these is specially adapted for the decoration of objects in china, porcelain and glass, and generally for articles made for sale on a large scale; while the second, which is capable of rendering results equal in beauty to the best albumen prints, is better fitted for portraits and similar works. The formulæ and directions which are here given for both processes have been thoroughly proved by experience.

The Dusting-on Process.

In this process it is first necessary to take a transparent positive on glass which is to serve as negative for the plate. This positive is taken in the camera by the ordinary wet collodion process; it must be fully developed, the high lights full of detail and well grounded, otherwise the print taken from it will be poor and weak. A transparency of this kind must be examined by transmitted light; in this respect it is to be distinguished from transparent positives to be burnt in direct, as will be described further on. The ordinary negative developer may be used. Any one not in possession of a copying camera can make an ordinary camera serve his purpose by lengthening it and attaching a holder for the original negative. So long as the solutions for the dusting-on process are not mixed, they may be kept in the open day-light; after mixing, they can never be taken out of the dark room.

First Formula.—In a large flask are placed 500 grammes of powdered borax, and the flask is then filled up with distilled water. It is left to dissolve for three days, the process of solution being assisted by occasionally shaking the flask; the clear solution of borax is then poured off, and the flask again filled up with fresh water, the process being repeated until the whole of the borax is dissolved.

No. 1.—Distilled water	... ...	1 litre
White sugar	... ...	180 grammes
Powdered gum-arabic	...	60 ,,

This is well shaken until the whole is dissolved, and then half a litre of the solution of borax is added.

No. 2.—Honey	... ...	30 grammes
Solution of borax	...	180 ,,
No. 3.—Ammonium bichromate	...	30 ,,
Distilled water	... ...	150 ,,

For the preparation of the sensitive solution mix together

Solution No. 1.	... ...	2 parts
,, ,, 2.	... ...	1 part
,, ,, 3.	... ...	3 parts

When the weather is hot, rather a smaller proportion of the No. 2. solution should be used.

Second Formula.

No. 1.—Distilled water	... ...	1 litre
Powdered gum-arabic	...	20 grammes
Dextrine	... ...	100 ,,
Grape sugar	... ...	100 ,,
No. 2.—Distilled water	... ...	1 litre
Ammonium bichromate	...	100 grammes

To make the sensitive solution, mix equal parts of these two solutions.

Third Formula.

No. 1.—Distilled water	... ...	1 litre
White sugar	... ...	7 grammes
Honey (finest)	... ...	3 ,,
Gum-arabic	... ...	25 ,,
Glucose	... ...	25 ,,
No. 2.—Ammonium bichromate	...	100 ,,
Distilled water	... ...	1 litre

Mix equal parts of solutions Nos. 1 and 2.

Fourth Formula.

No. 1.—Distilled water	... ...	1 litre
White sugar	... ...	105 litres
Gum-arabic	... ...	130 ,,
No. 2.—Ammonium bichromate	...	100 ,,
Distilled water	... ...	1 litre

Mix as in the last formula equal parts of the solutions.

* *Photographisches Archiv.*

For carrying out the process are required two small precipitating glasses, in one of which is a funnel with a filter; further, some perfectly flawless plate-glass plates, a couple of porcelain evaporating basins, an iron plate-holder, an iron or steel plate, a spirit-lamp, blotting-paper, encaustic colours, a camel's-hair dusting-brush, and a copying-frame with glass plate. The glass plates must first be thoroughly cleaned in the usual way. Some of the sensitive solution is then poured into one of the precipitating glasses, and from thence flowed over a glass plate (previously carefully dusted) like collodion, the superfluity being run off at one of the corners on to the funnel. The plate must be held in a somewhat inclined position, with the corner where the superfluous solution was run off downwards, and it is then placed in the same position on blotting-paper to dry. The spirit lamp is now lighted, and placed under the plate-holder; on this latter is laid the iron plate, followed by two or three layers of blotting-paper, and finally on the top of these, the coated plate in a slightly inclined position. By this arrangement the plate is dried at a moderate heat. So soon as the upper surface has become clear and hard, the plate is ready for exposure. The transparent positive is now placed film upwards in the copying frame, and on it the prepared plate film downwards; the frame is then closed, taking care that the plates do not rub against each other.

As it is not easy to say beforehand what is the necessary length of exposure, the beginner will do well, before commencing, to work a trial plate, and to arrange accordingly. As a general rule, twenty or thirty seconds will be found to be sufficient in fine summer weather; if the light be dull, it will take as many minutes. The magnesium light may be employed, giving an exposure of from one to two minutes, according to the density of the positive. As is the case in carbon printing, a photometer may be used with advantage to determine the length of exposure. In cold weather, not only must the prepared plate be placed in the copying-frame in a warm state, it must also before developing be again dried and allowed to get cold. The hygrometric condition of the air during the whole process is a factor of importance, for if the film be moist the colour will run. On this account developing must be effected in a warm room, and the use of the hygrometer to ascertain the relative moisture of the atmosphere is recommended.

On removing the plate from the copying frame, the film will occasionally be found to already show an image, though this is not always the case. Taking now the plate in the left hand, throw on it with the right some of the incaustic colour in a powdered state out of a tin box, spread it over the surface with a soft gilder's brush, and return the excess to the box. Next lay the plate on one side for five minutes to let it absorb moisture from the atmosphere; this interval may be employed in developing some more plates, though is is better not to attempt to develop simultaneousty more than three or four plates. Dusting on the colour should be repeated altogether four times at intervals of from two to ten minutes, but it must be discontinued as soon as the image reproduces all the modelling of the transparent positive. It is of the greatest importance to determine accurately the requisite length of exposure; practice alone can ensure this being properly effected. It must not be forgotten that in exposing the plate in the dusting-on process the circumstances are just the opposite of those in other photographic processes; the shorter the exposure the darker will be the image, and *vice versa*.

It will be found to be an excellent plan to take three prints of each picture, and of these to fire only the best one; there is always one which turns out better than the others, and it is not worth while firing an inferior impression when it is so easy to take fresh ones. In order to judge correctly the excellence of the print, lay the plate carefully with the film downwards on a piece of white paper, which must be perfectly dry, or the colour will be smeared. It should be remembered that moisture plays the principal part in the dusting-on process.

In very dry weather it may happen that, though the print has been thoroughly developed, it does not possess the requisite vigour; this is a sign that it has been sufficiently exposed, but that the non-exposed parts are not moist enough to be sticky. In this case—but only in this case—breathe slightly on the plate, and then dust-on more of the colour.

(To be continued.)

PHOTOGRAPHY IN AMERICA.

BY F. M.

It may interest those of your readers who are not already versed in the art of photography as practised in America to peruse some experiences of one who has been there.

I started from London after serving an apprenticeship with a first-class West End House. On my arrival in New York I made the acquaintance of an artist who was preparing to start a high-class studio. He wished me to make myself acquainted with the mode of working in the States; accordingly I procured introductions to one or two of the best operators in the city; these gentlemen, without any prejudice or jealousy, kindly showed me over their establishments, including studios, dark-rooms, mounting rooms, printing departments, &c., &c., and inducted me generally into their system of working.

I found everything furnished upon a much more liberal scale than I had been accustomed to in London, I may add also much cleaner; in one dark-room (a roomy one not "cabined, cribbed, confined") I never upon any occasion saw a speck of dust, a bottle or piece of apparatus that was not actually in daily use, or that would be likely to accumulate dust and dirt; everything clean, orderly, and in its place.

Regarding formulæ and method of working, I soon found that I knew very little practically about the art; theoretically I was a good manipulator, coming with credentials from a metropolitan studio, and having in London produced good work; but I had been accustomed to buy my collodion of Thomas, or Mawson, and to send to Thomas for a new bath when the old one failed. Developer I had certainly made myself; also intensifying and fixing solutions; but for the main and principal agents in producing a negative I had depended entirely upon chemists, hence I was all at sea in New York.

I found the Americans all make their own collodion, bath, &c., procuring their chemicals principally from a Philadelphia firm, Messrs. Powers and Weightman; when their bath gets old they don't send it to a chemist, but boil it down themselves over a gas-stove or ordinary hard coal stove, and remake it—all of which I had to learn as if I were quite a tyro.

For chemical purposes they use water which is the same as supplied to the houses for drinking, and, in fact, all domestic purposes; it is called Croton water, from the Croton springs, a few miles out of the city; this water is so pure that it does not require distillation, but dissolves your silver without the slightest turbidity, which simplifies matters considerably for a photographer. No redeveloper is required, iron being sufficient in all cases; indeed, intensifying a negative is unnecessary in America, except in the case of some few copies of maps or prints, where a very white background is required; but for portraits it is never used. I attribute this to a great extent to the great actinism of the light from the almost invariable blue sky summer and winter alike.

Studios are nearly all painted blue, as in England, a north light being obtained where possible, and glazed to within a foot or so of the ground. Both ends are used in a large business such as I was accustomed to, the positionist alternately

doing duty at either end as the plates are ready in the hand of the operators, two dark room men being employed, they being supplied with clean plates from an adjoining small room. I do not think, however, that there is much difference between the studios in any country except in the adventurous display of decoration, or an elaboration of some particular system of blinds, both of which are in the way, and the latter very apt to get out of order. Simplicity in a studio is undoubtedly the best plan, and the one found to work with the most certainty. A slight choice of backgrounds is used in America, but, as a rule, the actual portrait of the sitter is what is found to be required, and as the Americans are rather fond of being well dressed, they like a portrait which shows up the costume, and also a good likeness, but I fancy backgrounds are mostly eschewed by the best artists.

The bath containing the bath solution is in nearly all cases larger than those used mostly in England; they are made of glass with glass dipper, and enclosed in a wooden case, painted black, and furnished with handles for the purpose of emptying and cleaning out. As I had been accustomed to a 10 by 12 bath in London, I found the American baths rather imposing at first, but I am certain better results are obtained by their use, there being no fear of damaging the film by contact with the sides of the vessel, also the plate has plenty of elbow room, and can be moved about in different directions so as to get an even coating, at all events; I believe that there is some virtue in plenty of bath solution, although I do not affirm that it is a *sine qua non*.

American negatives mostly have a margin around when fixed (or cut, as they call it) with either cyanide or hypophite, both being kept ready.

A Wedgwood basin is used for boiling down the bath, which is sometimes left cooking all night over a hard coal stove. Of course all operators have a second solution for use whilst the old one is being renovated; some operators have three bath solutions in use, to prevent the possibility of delay, but I have always found two suffice.

The American baths are mostly made 24 by 30 inches inside measurement, the case fastened at a convenient angle by a strap, which holds it in position at one side of the dark room; the size mentioned will of course take the largest plate used in any studio. Formulæ appended have been in use in the establishment where I was employed, for some years, and have not been changed, as I am informed by the manager, in a letter received a few weeks since.

Collodion.

Iodide of ammonium	... ...	4 grains
Iodide of cadmium	... ...	1 grain
Bromide of cadmium	... ...	2 grains
Cotton (to the ounce)	... ...	4 ,,

Two quarts are made before wanted for use, so as to have time to settle, no water being added under any circumstances, taking care to keep it a light orange colour by adding over night a little flake iodine. This collodion is used for all purposes and in all weathers, and has produced fine work without a single failure for years. The bath solution is kept at 41 grains, and slightly acidified with nitric acid.

The mode of cooking the old bath is to pour it into an evaporating dish, adding a few drops of ammonia, and boil to near dryness; when cool, bring it up to 41 grains, filter, add half an ounce of a 60-grain solution of silver, and acidify.

The developer used is four ounces of iron to 64 ounces of water, and acetic acid to suit.

I have never found any harm arise from boiling the bath; indeed, where you take from 40 to 60 cabinet portraits per diem it needs cooking about twice a week.

With regard to sitters, of the two I should almost give the preference to the Americans; but then I have not had much experience of English sitters of late years, and they may have improved, as we certainly have become a more dressy people on this side of the Atlantic; but still I fancy the American sitter relies rather more on the taste of the artist as to position, and places him or herself more in the hands of the photographer than we do; there is also, of course, a social freedom without bordering on licence, arising from Republican institutions, that conduces to make both parties at their ease. The only two sitters who ever caused me the slightest uneasiness in anticipating a visit were the late Ada Isaacs Menken, whom I photographed in the costume of Mazeppa; and a renowned prairie hunter named "Buffalo Bill;" this latter sitter I fully expected to find a very uncultivated individual, as I had heard of his adventures upon the wild Western plains; but I was agreeably disappointed by the advent in the studio of a tall gentlemanly man, rather slimly built, elegantly attired, wearing his hair, which was auburn in colour, curled in ringlets, a fashion in vogue amongst Western men; but, apart from this rather distinctive feature, his appearance and manners would have adorned any drawing room.

I do not think that I have any more to say on the subject of the art in America; so many photographs reach England from the studios there that your readers can compare the results obtained with their own.

WHAT CAN AND CANNOT BE PATENTED.*

1. Any new manufacture, art, process, machine, or apparatus, not publicly known, exhibited for sale, or described in any printed publication within the realm at the time of making application for a patent, can be validly protected.

2. A combination of known means, producing a new or advantageous result, can be validly protected; or the omission of any part of a known process or combination, tending to produce, by such omission, an advantageous commercial result, can be validly patented.

3. A know means, put to a new use, can be validly patented, as in the case of the "steering movement" (Plimpton's patent) to the wheels or runners of skates, such steering movement to other wheeled carriages having been long known before the date of his patent.

4. An improvement, brought about simply by the substitution of one well-known material for another, is not patentable.

5. A person holding Letters Patent for an invention which he offered for sale, or publicly used prior to obtaining his patent, has no valid title to such Letters Patent; or, if he used a process secretly, and sold the produce thereof before patenting, such patent will be valueless. [Mere prior experimenting, if kept secret, does not invalidate a patent.]

6. It has been decided that the existence of a prior, abandoned, and crude provisional specification or outline description, not sufficiently clear to enable a person to work from, will not affect the validity of a successful patent for the same invention afterwards obtained by another person.

7. A *principle per se* cannot be patented, but an inventor may claim the *application of a principle*, providing he clearly sets forth in his specification one or more modes of carrying the same into practical effect—thus closing the door to unscrupulous infringers.

8. An invention that has been registered as a useful or ornamental design, cannot afterwards be patented; nor can an invention be re-protected, except in the case of an uncompleted Patent (the article or the produce of which has never been offered for sale, and which, from the omission by accident, &c., of the payment for "Notice to Proceed" or "Sealing stamp," would otherwise become void). In this case, a new provisional specification must be filed, and a new Patent obtained before the expiration of the first provisional protection.

9. If any prior Foreign Patents for the same invention exist and become void, the English Patent lapses also.

* From *Ten Minutes in the Patent Office*, by F. des Voeux and E. G. Colton.

The Photographic News.

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CONTENTS.

MUNGO PONTON.

On the 3rd inst. there died at Clifton a man whose name is as intimately connected with the history of photography as are those of Niépce, Daguerre, and Talbot. However much we may argue and dispute over the claims of this man, and that, to have discovered or modified important operations in the practice of photography, to the British chemist, Mungo Ponton, belongs undoubtedly the honour of having unearthed that key-stone upon which the permanent printing processes of the present day are almost exclusively based. In 1839—the very same year that the wonderful process of Daguerre was announced to the world—Mungo Ponton called attention to bichromate of potash as a photographic agent. Nay, more; he described in the Edinburgh New Philosophical Journal a photographic process whereby permanent impressions upon paper might be produced; and although these, viewed by the light of to-day, appear crude and primitive enough, they mark the commencement of an era in photographic science.

Carbon printing—or, to speak more correctly, printing in pigments—collotype printing, and Woodburytype, all owe their origin to the discovery of Mungo Ponton, as do also, for the most part, the methods employed now-a-days for the production of ceramic photographs. We find the impregnation of colloid substances with the bichromates of potassium or ammonium resorted to in every printing process we turn to, with the exception, of course, of the chloride of silver method, the platinotype, and one or two insignificant exceptions. The Mungo Ponton discovery, we repeat, has had more to do with the production of permanent photographs than any other, while it may safely be said that there is not at the present moment any satisfactory mechanical process in which the reaction he made public does not constitute the most important feature.

It is interesting at this period of time to turn to the original memoir contributed by Mungo Ponton on the subject of securing photographs by the aid of bichromate of potash, which, as we have said, was first published in an Edinburgh journal. In reading it, many of our readers will be reminded of their school-days, when a sheet of paper was furtively washed over with the yellow liquid under shadow of the school desk, and exposed to light in the sunny playground. Fern leaves, lace, copy-book covers, nay, even the human hand, were employed in those days as negatives, the washed and dried prints being duly put away among other boyish treasures. Certainly Mungo Ponton's was the first photographic process to become thoroughly popular.

Here is Mungo Ponton's original description of his method.

"When paper is immersed in the bichromate of potash, it is powerfully and rapidly acted on by the sun's rays. When an object is laid in the usual way on this paper, the portion exposed to the light becomes tawny, passing more or less into a deep orange, according to the strength of the light. The portion covered by the object retains the original bright yellow tint which it had before exposure, and the object is thus represented yellow upon an orange ground, there being several gradations of shade, or tint, according to the greater or less degree of transparency in the different parts of the object.

"In this state, of course, the drawing, though very beautiful, is evanescent. To fix it, all that is required is careful immersion in water, when it will be found that those portions of the salt which have not been acted on by the light are readily dissolved out; while those which have been exposed to the light are completely fixed on the paper. By the second process the object is obtained white upon an orange ground and quite permanent. If exposed for many hours together in too strong sunshine, the colour of the ground is apt to lose in depth, but not more so than most other colouring matters. This action of light on the bichromate of potash differs from that upon the salts of silver. Those of the latter which are blackened by light are of themselves insoluble in water, and it is difficult to impregnate paper with them in a uniform manner. The blackening seems to be caused by the formation of oxide of silver.

"In the case of the bichromate of potash, again, that salt is exceedingly soluble, and paper can be easily saturated with it. The agency of light not only changes its colour, but deprives it of solubility, thus rendering it fixed in the paper. This action appears to consist in the disengagement of free chromic acid, which is of a deep red colour, and which seems to combine with the paper. This is rendered more probable from the circumstance that the neutral chromate exhibits no similar change. The best mode of preparing paper with bichromate of potash is to use a saturated solution of that salt; soak the paper well in it, and then dry it rapidly at a brisk fire, excluding it from daylight. Paper thus prepared acquires a deep orange tint on exposure to the sun. If the solution be less strong, or the drying less rapid, the colour will not be so deep. A pleasing variety may be made by using sulphate of indigo along with the bichromate of potash, the colour of the object and of the paper being then different shades of green. In this way, also, the object may be represented of a darker shade than the ground."

NEW IRON DEVELOPERS FOR EMULSIONS.

Pursuing his recent investigations on developers, Mr. Carey Lea has discovered that there is a large number of salts of iron which possess developing power. He has tried ferro-phosphate, sulphite, and borate in solutions of potassium or ammonium oxalate, and expresses a highly favourable opinion on the developing action of all these salts on silver bromide. For dissolving the insoluble salts of iron the alkaline tartrates may also be used with advantage, the neutral tartrates of ammonium or sodium being more especially adapted for this purpose.

Mr. Carey Lea's researches have very great interest for the theory of photography, for they show that ferro-hyposulphite, metaphosphate, metapectate, antimono-tartrate, and other similar compounds, form more or less powerful developers; but when he goes on to attribute a value to these salts for practical purposes, we find ourselves unable to agree with him. We tried in the first place the borate developer which he so strongly recommends:—

Neutral potassium oxalate	... 400 grains
Borax	... 100 ,,
Dissolve in hot water ...	... 4 ounces

"When completely dissolved, add ferrous sulphate, 120 grains. Add more water until the entire solution makes six ounces, and shake until the ferrous salt dissolves. Let stand for six or eight hours, and filter. For use, dilute with three or four times its bulk of water."

This solution, after the addition of a little potassium bromide, certainly possesses a developing power, though not a very high one; gelatine plates developed by it render only the high lights effectively, while the ordinary oxalate developer, prepared by mixing together potassium oxalate and iron sulphate, after a shorter exposure, produces an image with much better and fuller detail.

If borax is added to the ordinary oxalate developer in a perfectly neutral state, no action can be observed; but when the developer has at the commencement an acid reaction, it is improved by the addition of borax. This is no doubt due to the fact that the acid reaction lowers the energy of the oxalate developer, and that through the slight alkalinity of the borax this acid reaction is removed. Borax is only alkaline in a very small degree, so that it does not cause the plates to fog. Our own experience is that the boro-oxalate developer, when in the dilute state above described, is less effective than the old ordinary oxalate developer, and when concentrated to the same strength as the latter, is not one whit superior to it. The boro-oxalate solution, moreover, grows turbid much sooner than the ordinary oxalate developer.

The phosphate developer produced by the solution of ammonium oxalate, sodium phosphate, and ferrous sulphate, grows turbid by standing or during the process of development, even more than the boro-oxalate developer. It is also less effective than the latter, and on that account less to be recommended.

Carey Lea attributes many advantages to the sulphite developer; he considers it to be equal in power to the borate, and either of them to be superior to the ordinary oxalate developer. For ourselves, however, we were unable to obtain equally satisfactory results, though we prepared the solution according to Mr. Lea's own formula:—

"Neutral potassium oxalate ...	440 grains
Neutral sodium sulphite... ...	60 ,,

Dissolve in as much hot water as will make 6 ounces, and when the solution is complete, add ferrous sulphate, 160 grains. Then shake until the solution is complete." He further recommends that this solution, before using, should be diluted with from three to four parts of water, and that a little potassium bromide be added.

Having tried this developer, we cannot say that, in the diluted form, as recommended by Mr. Carey Lea, it possesses any great power, but in a state of concentration it can be employed with effect, though not to the same extent as the ordinary oxalate developer. In fact, we found that there is no marked difference between the action of this sulphite developer and that of the ordinary oxalate developer when in the same state of concentration.

The above-mentioned boro-oxalate, phosphate, and sulphite developers, though they are not equal in effect to the oxalate developer, are, at any rate, quite serviceable; but the same cannot be said, according to our experience, of the boro-tartrate developer, for which Carey Lea gives the following formula:—

Neutral ammonium tartrate ...	200 grains
Borax	50 ,,
Water	3 ounces

When fully dissolved, add—

Ferrous sulphate...	50 grains

Of this solution Lea says:—"This is a powerful developer, and gives exceedingly good images. In power it seems equal to the borate developer made with potassium oxalate." In all our own experiments, however, we found this solution to work exceedingly slowly, and to possess a very inferior developing power. To obtain with it even a semi-developed image the plate must be exposed for more than ten times so long as is required when working with the ordinary oxalate developer. We cannot, therefore, by any means recommend this developer.

As Mr. Carey Lea himself confesses that the other developers described by him are not so good as those above mentioned, it does not appear necessary to go into further details concerning them. All these new developers are more complicated in preparation than the ordinary oxalate developer; almost all are inferior in power, and not one is better.

Let us add, in conclusion, that we cannot agree in the opinion that the oxalate developer made by boiling has a different mode of action from that prepared by mixing with ferrous sulphate. In the course of a considerable number of very careful experiments we found that both kinds have the same active power, provided they possess the same percentage of active ferro-oxalate.

Notes.

Dr. Hermann Vogel, of Berlin, is just now in London.

Mr. Mungo Ponton, who has just died at the age of seventy-eight, was a Fellow of the Royal Society of Edinburgh. He may be regarded as the last of the fathers of photography.

Next Wednesday the British Association meet at Swansea under the presidency of Professor Ramsay, the Director-General of the Geological Survey of the United Kingdom. Mrs. Crawshay, we see, maintaining her late husband's character for hospitality, has invited a number of the members to spend a day at Langorse Pool, Brecon.

"Why don't you publish your portrait of Gladstone?" we asked a photographer the other day; "it is one of the finest that has been taken of him." Our friend shook his head. "There is not sufficient smoothness and glaze to suit the public; if I were to pencil away the markings on the forehead, and smooth the furrows between nose and cheek, the picture would sell, no doubt, but I should spoil my negative." And our friend preferred to keep his negative.

It is only the deeply-rooted liking for French plum-box portraits over again. In Paris the carte emaillée was popular ten years ago; it is popular still. Sitters ungrudgingly pay fifty per cent. more for pictures with a glaze of gelatine and a broad marginal line of vermilion. There is an "article de Paris" look about the finishing touch, and the result a smart, showy object; and as there are many more Veneerings in this world than people with artistic taste, it is but natural that "bonbon" pictures should command a ready sale.

There was no more inveterate foe to retouching, glazing, and vermilion lines than Rejlander. At the same time, he was ready to give their producer his due. Such portraits, he acknowledged, were often very bright and pretty, and indicative of considerable skill; they had a finish and nattiness about them that could not fail to please, but—they did not represent art. Need we add that Rejlander died a poor man?

The toning of collodion transfers and opal enlargements frequently gives trouble, and many will care to know that large producers of portraits of this kind—such as Messrs. Brown, Barnes, and Bell, of Liverpool, and M. Lafosse, of Manchester—do not tone at all. The former firm sometimes put a little gold in the fixing bath, but this is only on rare occasions.

Experience in developing alone yields a good tone, in the opinion of these gentlemen. The Liverpool firm have a predilection for pyrogallic development in summer, and iron development in the winter. For opal work they like a very limpid collodion which contains plenty of cadmium.

Messrs. Parry and Tucker have published their important paper on the application of the spectroscope and camera in the analysis of iron and steel, to which we have already referred in these columns. When a body is subjected to the intense heat of the electric spark, it is, as we know, volatilised, and emits rays of certain colours—or, more correctly speaking, of certain wave lengths. These wave lengths are constant for the same body; hence it follows that when two or more substances are volatilised together, the spectrum formed may be regarded as a sum of the wave lengths, and if these are thrown upon a sensitive plate, we have a photographed spectrum.

Theoretically, say the authors, a well-focussed photographed spectrum of any iron or steel should be an unerring index to its composition; and in practice, although this is not absolutely true, the lines in the photograph tell us more than we could otherwise divine. The question whether two steels are of the same quality might be settled in half an hour by photographing the spectrum of each, side by side, on the same plate, supposing the two metals to be homogeneous.

The value of photography in this branch of scientific research may be gathered from one of the concluding paragraphs of the memoir: "There is something so absolutely certain in a photographed spectrum that it is most desirable, if possible, to establish photography as the basis of all spectroscopic work."

Levitsky, the Court photographer at St. Petersburgh, employs electric lighting in a most systematic manner for portraiture. He has an electric lamp fitted in nearly every room of his house, and is thus enabled to employ any apartment he pleases as a studio; and so successful are his pictures that they are not to be distinguished from those taken in daylight.

But to appreciate the full importance of M. Levitsky's arrangement, it must be borne in mind that during the winter months in St. Petersburgh there is sometimes not more than a couple of hours' daylight during the whole twenty-four hours; while, as everybody knows, the season and gay time of the Russian metropolis happens just at this period. In M. Levitsky's case, therefore, the game must be worth the candle.

Photographs by gaslight. The history of photography is not a long one, but it is beginning to repeat itself. In 1855 Dr. Lover exhibited to the Dublin Photographic Society—for Dublin had a society in those days—an apparatus for taking photographs by gaslight, the main feature of which was the introduction of a stream of oxygen into the gas, the latter having first been charged with carbon. With the assistance of a reflector there was sufficient light, we are told, to take a photograph of an engraving in a "remarkably short period."

In the opinion of a painter who has had much to do with the treatment of photographic enlargements upon canvas, the only trustworthy method of producing the latter is by the dusting-on process. If you can manage to apply a film stable enough to take the painting, you are never sure that it will not peel off after the picture is finished and hung. "The Mayor of Manchester has lost his head," the people of Cottonopolis used to say because a fine painting of the civic head began to peel after it had been hung some months. The best plan, however, is not to apply photography to the canvas at all, but to employ a transparent print upon paper, and to trace the principal features on the canvas through this.

While waiting for some photographic process for transferring photographs into printing blocks, a good many of the illustrations for scientific works are now drawn on the wood from negatives. The surgeon, microscopist, astronomer, as the case may be, instead of furnishing the draughtsman or cutter with a rough hand-sketch, supplies him instead with a photograph taken by means of a camera, which frequently finds a place in library and laboratory now-a-days.

A North country photographer the other day told us, he was delighted at having taken a spell at gelatine plates in the studio. He practised the dry process for a full month, and it was most refreshing to come back once more to wet collodion plates, whatever their attendant troubles might be. After flashing drop shutters and instantaneous films, hot closets and fiery ruby, to get back to slow exposures and slow development, he assured us, was positively delightful, and even the smell of collodion in the yellow-lighted dark room was grateful to the senses.

Many of our readers must remember Paul Bedford. The ponderous comedian came up to town one day from Edinburgh in the "Flying Scotchman"; the rattle, the vibration, the tearing speed of the train all the day through was too much for the old gentleman's nerves, and he arrived on the platform at King's Cross half deaf with the noise and bustle. He picked out the craziest four-wheeler he could find, horsed by an aged quadruped of feeble mien. "Can you drive a mile an hour, my boy?" he asked the driver. The man of many capes vouched his ability to do so. "Then for goodness sake let me get in." Paul Bedford used to say, he never enjoyed a ride so much; at the same time, four-wheel cabs and four-wheel photography are not agreeable under all circumstances.

Topics of the Day.

THE PANEL PORTRAIT.

BY GILBERT FANE.

In my last paper I spoke of "motive" in photographic pictures, and laid particular stress on two points; to wit, that all pictures should have a distinct motive, and that the motive should be one well within the capacity of photography to pourtray. I said that as the camera requires the model to be momentarily still to get a good picture, the motive chosen should be one that also enjoins momentary stillness. Obviously, therefore, the choice of subjects for the camera is more limited than those of the painter, for the painter can render all the photographer does, and more besides.

At the same time, there are plenty of motives for pictures at the disposal of the photographer if he can only think of them. Rejlander's study of a boy "catching a blue bottle," as well as the companion picture, "caught," are two exceedingly good examples. The animation of the face is perfect in the first of these; although the boy with his hand stretched out against the wall ready to strike is still as a cat watching a mouse, his countenance is full of life and expression. In "caught," one cannot see the boy's face so well, for he is looking down examining his captive; but the motive is here, in accordance with the requisites of photography, and the result, in consequence, a happy picture.

But under ordinary circumstances the photographer cannot always fulfil the conditions necessary to the taking of a perfect picture; if he is a portraitist and has but half an hour or even less to devote to a sitter, it is impossible for him to do all he wishes. And when we cannot do as well as we wish, says an old proverb, we must do as well as we can. So photographers, I think, would do wisely, when they have to take portraits quickly, to confine themselves to depicting the sitter, and eschew the surroundings as much as possible. This brings me to my subject, the panel portrait, or promenade portrait, as I think it is indifferently called.

Mr. Editor has sent me a numerous series of these slender and elegantly-mounted prints for inspection, and I must say that they embody much that is artistic. Moreover, they seem to me to be in keeping with the photographer's work. While the form is pleasing, and there is space enough for an excellent portrait, little else but the model is to be seen; and this, I take it, is desirable. A man or woman desires a representation of his or herself, and does not want a lot of furniture besides. In the squarer form of pictures, there is in the case of standing figures always space to spare, and this space is frequently filled in with furniture and accessories. If these are not too prolific, and taste has been exercised in their selection and position, the effect, no doubt, is not displeasing; but, unfortunately, in most of the portraits that I have seen, the photographer appears to have been quite as anxious to exhibit his stock of furniture as his skill in posing. It is a difficult matter to fill in detail in a picture, and photographers, I have said, never have much time at their disposal, even when they possess the art knowledge.

Again, I have a fault to find with the furniture generally employed by photographers. In the first place, it rarely looks real; and secondly, it is often too new and shining to appear artistic. There is one combination of chair and sofa that is my especial abomination; it is an article one meets with in the studio, and nowhere else. The "prie-dieu" may be very well in a Roman Catholic country, but it is rarely to be met with in private houses in this country; and yet, if we are to believe the photographer, every other lady in the land is posed on it. It seems to me to be the photographer's aim to render his furniture as if it came from the Veneering household, spic-and-span new, and so highly varnished as to be almost sticky. The days are fortunately past when the broken marble column was represented on a piece of stair-carpeting; I hope that ere long we shall have seen the last of the collections of bright furniture that many photographs now contain.

It is mainly, I believe, because of my aversion to overdoing it, both in the quantity and quality of the accessories, than for any other reason, that I am in favour of the panel portrait; still, there is something classic in one or two of the pictures I have received. Panels in some of our old painted windows are not unlike, in their proportions, to these new pictures, and if the models are suitable and well posed, the result is pleasing indeed. A lady in flowing robes, with figure half turned, is a particularly charming subject in one of my pictures; and another study—a slim little maid reaching up to a bird cage—is hardly less successful.

The Topic for next week will be "Developing in Daylight," by Jabez Hughes.

THE PREPARATION OF GELATINE-BROMIDE.

BY M. BASCHER.*

I first dissolve in the water-bath, heated by a nightlight,—

Water	275 parts
Nelson's No. 1. gelatine	30 ,,
Bromide of ammonium	7 ,,
,, ,, zinc	1 part

Generally, sufficient importance is not attached to the soluble bromide employed. That of ammonium gives very good results, but the negatives are often grey; it is to avoid this inconvenience that I add the bromide of zinc, which gives sharp and brilliant images. Bromide of lithium causes the film to adhere firmly.

While the preceding solution is in operation I prepare that of nitrate of silver:

Water	50 parts
Nitrate of silver	12 ,,

After mixing both, I leave them in the water-bath for three days. At the end of that time I pour the whole into a flat dish to set in a cool place; in summer, ice is sometimes necessary.

The gelatine, having set, is squeezed in a coarse cloth, and the shreds thus produced are plunged into a basin of cold water. I pour them on a sieve, by the aid of which I steep them in water several times renewed. I leave them to drain for a quarter of an hour, then wash in methylated spirits until the fragments become hard. They are then spread over a glass previously waxed and allowed to dry thoroughly, which takes about twenty hours. This dried emulsion is kept in cardboard boxes. In using, I dissolve it in water slightly alkaline in the proportion of 1 : 10, and spread it by means of a glass rod on plates previously coated with a 4 per cent. solution of white of egg to which sufficient chrome alum has been added to give it a bluish tinge. This substratum has great adhering properties.

The dry plates are packed up, and may be preserved for a long time away from the light and damp. The exposure is very quick; for landscapes I recommend a shutter which allows the foreground to act longer than the rest upon the plate. Either the ferrous oxalate or the ordinary alkaline developer may be used. To intensify, I employ the two following baths:—First,

A.—Water	50 parts
Bichloride of mercury	1 part
Bromide of ammonium	1 ,,

afterwards,

B.—Water	50 parts
Nitrate of silver	1 part
Cyanide of potassium (pure) ...	1 ,,

This last may be replaced by a five per cent. solution of ammonia.

If, on the contrary, the negative requires to be reduced,

* Read before the Photographic Society of France.

recourse may be had to a fresh bath of hyposulphite of soda, or a rapid immersion in a 1 per cent. bath of cyanide of potassium. When hyposulphite is used, it is desirable, after washing, to dip the plate for five minutes in

Water	100 parts
Alum	10 ,,
Alcohol	1 part

The tone of these plates is not the same as that of collodion negatives: it is as well to try them before printing. They permit of retouching.

Frilling does not generally take place, excepting in the hyposulphite; for that reason it is better to dip the plates in the alum bath before washing, or else to put alum in the hyposulphite bath.

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."

No. 9—A Schoolmate!

Here are two negatives wrapped up together. As the reader may judge, they represent one person; but how different are the circumstances, both in the life of the subject and in the advance of the art of photography! The first negative was taken by me when I was learning the profession, twenty years ago — indeed, as far as I can remember, it was one of the first I ever manipulated. It is a carte, with furniture enough to furnish a decent sized room; one of the old style, you know, with a balcony and a far-away view to back you up—where you used to be hampered up with all sorts of accessories, and where you appeared to be five miles off at least. There was no retouching in those days; the only thing used was a little gamboge or Prussian blue to lighten up the shadows or spot out the freckles. No mediums or Faber's pencils then! But then, again, you must consider that in those days—Yea, by my Halledom!—we never took anything worth retouching—the faces were all too small for the pencil, and we intensified so strongly that they did not require it.

Here he stands like a pigmy! Small, thin-featured, broad-collared, narrow-coated, and tartan peg-top trowsers! He was a nice lad then; and, singular to say, like the last "print," he was a schoolmate of mine. His name was Wright—David Wright; and from my earliest recollections of him he had a certain ambition—an ambition that the reader will form a better conception of when I repeat a common saying of his, viz., "I was born noble, and am bound to rise!" Now, considering that his mother was an Irish washerwomen, the reader may understand me.

Now, my young readers, pay attention to this: ambition, in my estimation, is one of the noblest attributes a man can have. Take my advice, and always try to equal those above you—surpass them if you can—but—but see that you only surpass them in honesty and uprightness. Do not do as my schoolmate did.

I have told you about the first negative; now my "print" must come between it and the second. It looks like a romance, but all I can say is that at times "truth is stranger than fiction."

When I took the above negative David Wright was an assistant in a pawnshop; his mother in early life had to deal with a certain Earl of B——; I mean in her *way* of business. By this means she learned all the family secrets; and the said secrets she related to her sharp young son. One of those secrets struck David's shrewd brain so hard that the mark remained indelible—in short, a quarter-inch bullet-mark, which puzzled the coroner and jury of San Francisco.

I will explain. The Earl of B—— had unfortunately a son of eccentric habits, a Bohemian—a rover—who, instead of quietly settling down and fitting himself for his seat in the House of Lords, chose rather to go and mix with the common herd. He would mow the wheat in the valleys of Germany; he would drive posts from Havre to Paris; he would steer a lugger to the deep sea fishings; in short he ed a most irregular kind of life, as the world says. At last, under an assumed name, he took the post of man before the mast on board a three-masted schooner bound for the cod fishings on the banks of Newfoundland. From that moment he was never more heard of. Years passed, and David Wright—who, unfortunately, bore a resemblance to the young Earl—landed on the quay of Montreal; he had barely collected his few belongings together when a gentleman who had been observing him very closely said—

"Do I speak to the Earl of B——?"

The devil was in David's pocket in the shape of an empty purse, and at these words the devil jumped from the pocket to the head, where he at once prompted his victim to the fatal step that ultimately proved his ruin.

"I am the Earl of B.——'s eldest son," quoth David.

"Then allow me to congratulate you, if I may use the expression," returned the old gentleman, as he shook him by the hand. "You are now the Earl."

"What, my father dead!" shouted David, still prompted by that awful devil that had sprung from his pocket to his head.

I shall go no further with this part, but conclude it by mentioning that David Wright, the washerwoman's son, was introduced to the elite of Montreal as the Earl of B., and within a week he had got loans and bills to the amount of £40,000.

For two years the police of New York hunted him; he was all over the globe. First they would hear of him in Egypt, then Algiers, then London, follow him to Paris to find he had gone to St. Petersburg. Somehow or other, I cannot tell how, he eluded them—I dare say more by chance than good management—until at last they spotted him in America. One morning there was a scene in the principal bedroom of the principal Hotel of San Francisco. A gentleman had blown his brains out. That was the end of David Wright.

Three years ago, when I went to Bath to fill an engagement, I was asked by the printer if I had ever heard of the Earl of B—— that he had been photographed, &c. I said I had heard of him, but had never seen him. The subject was then forgotten, until one day the printer, looking for a negative, exclaimed, "Mr. B., here is the Earl of B——!"

When I looked through that negative every particle of strength departed from me; in the highly retouched negative I instantly recognized my old "schoolmate"; a light dawned upon me, and I knew who the poor fellow (excuse the term, because he was a school chum) was who personated the Earl of B——.

Twenty years between them—the puny old-fashioned looking boy, and the cool clear-headed swindler! The untouched and the touched! He was my schoolmate: R. I. P.

PHOTOGRAPHY BY GASLIGHT.

BY P. MAITLAND LAWS.

I will endeavour to satisfy your readers as well as I can in respect to the several queries that have been asked on the above subject. In the first place, about the gas meter I employ. I had a new meter and one-inch supply pipes fixed specially for Wigham's burner. The meter is a thirty-light one, and passes 180 feet of gas per hour. Most gas companies lend metres on hire, but it can be purchased for £4 10s. The burner consumes 160 feet of gas per hour when giving a steady flame; when burnt to excess, giving a slightly roaring flame, the consumption of gas reaches nearly 200 feet per hour.

The price of Newcastle gas is two shillings and sixpence per thousand feet, so that if the lamp is kept constantly burning the cost for gas would be about fivepence per hour.

In practice, however, I find the light emitted by a small bye-pipe ample for focussing, but not quite sufficient for judging effect of light and shade; this can be accom-

plished in a minute or two. You will see that the consumption of gas per sitting is very trifling. In last week's News you gave the price of the first burner I used—it consisted of twenty-eight jets, and cost £5. I soon discarded it in favour of the sixty-eight jets, which cost me £8.

Messrs. Edmundson and Co. manufacture burner, stand, reflector, &c., complete, and Messrs. Mawson and Swan are sole agents; for particulars and price of whole apparatus I must ask you to refer your readers to them.

In conclusion, I may say that I have read with much interest your articles, and one by an "Occasional Correspondent," on the subject, and may have something to say about naphthalizing, &c., when I have made some further experiments in that direction.

Correspondence.

HOLIDAY PHOTOGRAPHY.

Sir,—In a recent number, Mr. Bradforde mentioned a delightful spot for amateur and professional photographers to visit for a holiday. There is a very pretty spot situate about three-quarters of an hour's ride per rail from Waterloo or London Bridge, where a photographer may spend many a pleasant hour, viz., Ashtead, a small village. The common or forest is one mass of rustic views; in some places, turn which way you will, small parts meet your eye. When you arrive at the station the common or forest is straight before you; some of the prettiest parts may be seen by turning round at the left hand side of the hedge when you are going up the rising ground, and beyond the barns and small farm-yard; you may work from thence round any of the drives; but I would not advise going amongst the rushes or wet swampy places, as adders are plentiful; by keeping your eyes open you may steer out of their way, and they will yours. There are some pretty bits, near the barn, of old trees; work up the drives, and round to the right, you will find plenty for a day's work. The sort of day suitable for it is a quiet day with light clouds about. There are some very good panoramic views to be had as well. To the dry-plate worker it will be quite a charming spot—ferns and blackberry clumps, with thorns, and the old oak pollards.

Refreshment should be taken, as the nearest hostelry is a mile away. A draught of water may be obtained at the last cottage. All day may be spent there, and all that will be seen will be perhaps a gipsy or two, an old sheep, with a common colt or two. I got sixteen good negatives with the wet process.

I would recommend any one who thinks it worth while to go, to wear a good thick pair of walking shoes. Last summer was very wet; there has not been so much rain this summer; as it may be drier, I would advise the dry process, as water is a very scarce article there. If visitors would like a little village life they should go the reverse way from the common—the obliging station master will direct. There are some old trees with deer in the park. Going quietly, a shot or two may be got at the deer with the camera.—Yours obediently,

Richard Huck.

DEFECTIVE APPARATUS.

Dear Sir,—I have been working the gelatine process for some months past, both in and out of the studio, and for some time was considerably annoyed by finding upon a number of plates a white cloud, varying in size and density according to the length of exposure and the whiteness of the subject in proximity to the centre of the plate. I immediately made a search for light in the camera, but found it to be perfectly safe in every respect. Upon examining the dark slide (which was a new one) I found the spring screwed into the back to be nickel-plated, and was bright and shining. This I have proved to be the cause of the white cloud in the centre of my plates, the light being reflected from the spring back. Manufacturers should not, of course, place such springs in slides, and I advise those who have such springs to blacken them with indian-ink. Trusting this will benefit some one.—I remain yours truly,

Wallace Bennetto.

APPARATUS FOR THE MILLION.

Sir,—In last week's News I saw the suggestion "that the present pushing age may produce a small photographic camera, dark slide, and lens for about a shilling." As it might interest some of your readers, please allow me to state that I am the inventor of a quarter-plate camera with rising front, lens, dark slide, and focussing screw which can be made, not for a shilling, but I believe for about five shillings, perhaps under; the lens, of course, would be of meniscus form, which I think can be purchased for about ninepence. The dark slides could also be made to fit any quarter-plate camera for one shilling, and are perfectly light-tight, and stronger than the ordinary slides. I am not in a position to manufacture these instruments, but shall be very pleased to give further particulars if required.—Yours very respectfully,

H. Stone.

DRY PLATE DEVELOPMENT.

Sir,—We have practised photography this last thiry-one years, consequently seen many changes, and, to our loss, tried too many; but I do think we must be working nearer perfection since the gelatine plates and Dr. Eder's developer came out, and trust Dr. Vogel has hit the last nail. I have always thought many of the formulæ published are not put plainly enough (as your "Subscriber for Many Years" states), and it would be well if experimentalists bore this in mind for the future. As to the chloride of mercury, which has lately been spoken of a good deal, it may soon be dissolved if you pour boiling distilled water upon it in a mortar or jug. It was largely used, before any other mode of making a glass negative into a positive picture, thirty years ago.

We make Dr. Eder's developer in this way: one pound of neutral oxalate of potassia is put in just as much distilled water as will nearly dissolve all of it and be saturated. Three parts of this are used to one part saturated solution of iron. We could take fifty negatives a day, if all the plates were good, and not make a miss.

We prefer Dr. Eder's developer to any in existence, and have tried pyrogallic in all the ways we could invent, but could arrive at no certainty.—yours truly, W. N.

DIXON'S LIONS.

Dear Sir,—In your last "At Home" you alluded to lions and tigers by H. Dixon; here is a slight error which I would not notice only that it affects a principle which I think important. The negatives were taken by my son, T. J. Dixon. I print and publish them. According to general usage I might have called them mine, and exhibited the lions in my name, but my son was working alone when the negatives were taken, and to him belongs whatever credit is due, especially for patience and perseverance. He exhibited the lions and received the medal. The enlarged negatives were also made by him by a method I have already described, and which I find is the way to get the most perfect results.—Yours very truly,

Henry Dixon.

Proceedings of Societies.

French Photographic Society.

A meeting of this Society was held on the 2nd ult., M. Davanne in the chair.

A letter from M. Devaux was read, describing a method of transferring a silver print to zinc. The process consists in

transforming a collodion print, developed and fixed, into chloride of silver, by means of perchloride of iron, then, after having washed it, placing it under strong pressure in contact with a plate of zinc. The silver will be found brought back to the metallic state, and a black image formed upon the surface of the zinc. The author thinks that in this fact lies a germ which in its application may be of considerable importance.

Referring to the means of obtaining reversed negatives by methods recently suggested by Mr. Bolas and Mr. Brooks, M. Perrot called attention to Poitevin's process published in 1859. M. Poitevin coated his plate with iodised collodion; it was then sensitised, exposed for an instant to the light, and submitted to the iodine bath; he next exposed it in the camera, and afterwards developed. He thus obtained a direct positive. It must be added that this method is only the application to collodion or gelatine of M. Bayard's paper process, contemporary with Daguerre's discovery.

M. Bascher described his process of preparing gelatine bromide (see page 405.)

M. Davanne showed a series of very fine prints, and remarked upon them. They were obtained from gelatino-bromide of silver plates, and taken by M. Jouet. The exposure of the plates varied from one to five seconds; one second when the large diaphragm of a rapid rectilinear lens of 0·20m. focal length was used; five seconds with the smallest diaphragm of a rectilinear lens of 0·30m. focal length; showing that the same preparation may be used with equal success for landscapes, buildings, and instantaneous subjects. The developer was made in the proportion of four parts of oxalate of potash to one part of oxalate of iron, both used in almost saturated solutions. The plates were allowed to remain three minutes in the developer, and afterwards fixed in hyposulphite of soda, 20 per cent. solution, to which, at the moment of using, 5 per cent. of powdered alum was added.

M. Janssen read a communication on the inversion of the photographic image by the prolongation of the luminous action.

M. Joly made some remarks on the emulsification of bromide and iodide of silver, and exhibited some remarkable pictures.

M. Andra made several observations on the preparation of gelatino plates.

After some remarks by MM. Jonte, Clouzard, Martin, and Renard, the proceedings terminated.

Talk in the Studio.

The British Association.—The fiftieth annual meeting of this Association will commence at Swansea on the 25th instant. The president-elect is Mr. Andrew Crombie Ramsay, LL.D., F.R.S., V.P.G.S., Director-General of the Geological Survey of the United Kingdom and of the Museum of Practical Geology. The first general meeting will be held on the day named at 8 p.m., when Professor G. J. Allman will resign the chair, and the president-elect will assume the presidency and deliver the inaugural address. On the 26th there will be a soirée, on the 27th a discourse by Professor W. Boyd Dawkins on "Primeval Man," on the 30th Mr. Francis Galton, M.A., will lecture on "Mental Imagery," and on the afternoon of the 1st prox. the concluding meeting will be held. On the evening of the 28th (Saturday) Mr. Henry Seebohm, F.Z.S., will deliver a lecture to the operative classes on "The North-East Passage." There will be various excursions during the meeting to places of interest in the neighbourhood of Swansea. The sections will be as follows:—Mathematical and physical science (president, Professor W. Grylls Adams); chemical science (Mr. Joseph Henry Gilbert, Ph.D., F.R.S.; geology (Dr. H. Clifton Sorby); biology (Mr. A. C. L. Günther, M.A.); geography (Lieut.-General Sir John Henry Lefroy, C.B.); economic science and statistics (Mr. Geo. Woodyatt Hastings, M.P.); and mechanical science (Mr. James Abernethy, V.P. Inst. C.E., F.R.S.E.).

Fire by the Sun's Rays.—Flames were discovered yesterday afternoon in the centre of a drawing room in Norton Road, Cliftonville, and an investigation of the cause revealed the fact that a table had been set on fire in consequence of the cover becoming ignited by the sun's rays, which had been concentrated through the medium of a decanter of water. Fortunately, the discovery was made before the fire had communicated itself to any other article of furniture in the room.—*Daily Telegraph*.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

W. L.—You have doubtless received your picture by this time.

W. N. and Sons.—Our Publishers will register for you on receipt of a copy of the photograph and the sum of eighteenpence. The law relating to copyright can be purchased from Eyre and Spottiswoode, Queen's printers; the price, we believe, is fourpence. We thank you for letter.

A Puzzled One.—The print of the panel or promenade measures 7¾ by 3¾ inches; we have found it popular in nearly all the principal studios we have visited lately. It is hardly worth while going into the question of priority in such a matter; it is scarcely important enough, and anyone seeking to make his claim good in a court of law would be beset with difficulties innumerable. If you have no direct sunlight you can work very well without blinds; to get strong effects you must place the sitter tolerably near the glass, or allow clear light to shine upon him; otherwise it is unnecessary.

A. B. C.—We have no doubt it is the recent hot weather that has troubled you, either heating the solution or the film; a little ice or a cooler locality would no doubt set matters straight.

A. Wrighton.—It was a stupid slip of the pen.

Knight Errant.—Make them up in small parcels, and you will have no difficulty with the customs. Caddy tin or thick tinfoil.

J. B.—It is without exception the most complete hand-book we have in this country.

A Poor Photo.—The delay in the appearance of your letter was due to an anxiety on our part to add your description of shutter. Unfortunately, the sketch was a little rough, and we could not make our drawing clear enough. We should be glad if you would leave it as you mention, and thank you for the offer. You do not say the size of picture you desire; a maker would no doubt permit you to try an instrument before purchasing, and that would surely be your best plan of selection. They may be dried in twenty-four hours, but the films often take longer; gelatine runs at about 90°, and any heat under this may be used; get as much ventilation as you can. Our advice is, do not add bichromate.

C. Z. F.—The second paper you name is advertised in our columns nearly every week. The first has been out of the market some time.

Crichton.—We do not think so.

T. Bright.—1. To neutralise the acid in the chloride of gold. 2. The London Stereoscopic Company and the Van der Weyde studio, both of which are in Regent Street.

South Devon.—You did not, in all probability, wash sufficiently after fixing; this is indespensable. But when there is a deposit, this should not, with care, cause stains.

A. B.—We are sorry to say that the defect you complain of is one inherent to the process; all mercury-intensified negatives change in a measure with the action of light. At the same time, the examples you mention are very marked. We hope soon to publish a more improved method still of intensifying with silver.

J. E.—We think the cause you mention is hardly likely to spoil the bath, although doubtless the solution might be affected by the metal. Try coating with normal collodion, either using this as a varnish, or by dipping.

Experiment.—The method, as you describe it, appears to possess many advantages; we shall be pleased to hear of your further experiments.

Silver.—In our last Year-Book you will find instructions for working with collodio-chloride of silver.

Beginner.—Send us your prints; we shall be very pleased to give you what assistance lies in our power.

S. G.—In our next; too late for this issue.

A. B.—Thanks; we quite agree with you.

W. S. R.—You should not have attempted to take your picture in such bright sunshine; if well intensified, you might still get a pretty picture.

W. W.—They must be quite dry before burnishing; scratchings may be due to particles of dust.

Pencil.—We are not sure, but if you try Newman, of Soho Square, he will doubtless tell you the best kind of brush to use.

Harry B.—The specimens sent are too imperfect for us to decide where the fault lies.

J. B.—With a *transparency* of your portrait, you can certainly get a very pretty picture for your magic lantern.

Daw.—State what kind of portraiture you mean, whether large or small.

A Constant Reader.—In our next; we regret that your letter did not come in time.

The Photographic News, August 27, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Enlargements on Canvas—Transference of Photographs to Wood Blocks—Portraiture by Artificial Light—Apparatus for the Million.

Enlargements on Canvas.—Regarding few points of photographic practice do we hear of such bitter complaints as those made in consequence of the peeling off of oil pictures painted over a photographic basis. The reasons of this are not difficult to find, as anything of the nature of a film between the prepared canvas and the picture is almost certain to lead, sooner or later, to a woeful catastrophe like that which has happened to the "counterfeit presentiment" of Manchester's civic head; and, moreover, the large amount of money often expended on such undermined paintings makes the complaints both loud and deep when the evil day of destruction arrives. Passing over all film methods as unworthy of notice, the dusting-on process claims our consideration, as some people place much confidence in it, and regard the painting which has been made over a dusted-on picture as equal in stability to one executed directly on the artist's prepared canvas. It is difficult to imagine that this can be the case; as the small amount of mucilaginous, gummy, or saccharine matter which serves to hold the powder colour would be exceedingly likely to completely prevent any true union between the oil paint which forms the general grounding of the canvas, and the painting itself. The ease with which a thin film of foreign matter often prevents perfect adhesion between materials of a similar nature is sufficiently well known to all those who have to do with moulding operations of any kind, and it appears to us that to risk valuable artistic work on a canvas bearing a dusted photograph would not be altogether a discreet proceeding. There is one class of photographic print, however, which appears altogether without objection as an intermediary between the prepared canvas and the work of the artist, this being a picture executed in fatty ink alone. Printer's ink is so nearly of the nature of paint, that it may be assumed to fairly and thoroughly unite with the grounding paint used as a preliminary preparation for the canvas, and also with that applied by the artist. The difficulties of making a fatty picture suitable for transference to the canvas are by no means great; in fact, the operation of performing this is easier, and involves less preparation, than is required to make a dusted picture. A photographic transfer which shall represent the half-tones of a negative as a kind of stipple or grain is easy to make, although the operation of printing from a stone to which the image has been transferred is quite a different affair. When Mr. Bolas was lecturing at the Society of Arts on "Photo-mechanical Printing Processes," he showed a modification of a stipple process due to Asser, and illustrated it by making a transfer from a landscape negative over thirty inches long. The process is briefly as follows:—A sheet of blotting-paper is smoothly covered with a thin paste made by boiling 1 part of flour with 10 or 12 parts of water. When dry the paper is rendered sensitive by being soaked in a 3½ per cent. solution of potassium bichromate, and, after having been once more dried, it is exposed under a reversed negative. When Mr. Bolas illustrated the process at the lecture, he exposed for about five minutes to the light produced by burning magnesium wire, but a few minutes in the sunshine may generally be considered sufficient. The print is next soaked in water to remove the excess of bichromate; and, after drying, it is ironed with a warm flat iron in order to harden the coating on the paper. Being now again moistened, the print is dabbed all over with a stiff hog-hair brush slightly charged with printer's ink, which takes on the exposed portions, and refuses to adhere to the unexposed portions. When the picture is about half dry, it is well rubbed down on the canvas, and allowed to dry in contact with it. All that is now necessary is to soak off the paper, so as to leave the fatty impression behind on the canvas.

Transference of Photographs to Wood Blocks.—The process above described answers completely when the engraver requires a photographic guide on his prepared block, only a direct negative is required instead of a reversed one; and it is not advisable to let the transfer dry on the wood block, as this would involve the application of water. The best way is to pass the nearly dry transfer and the block through a lithographic press, and to strip off the paper immediately afterwards. The use of photo-lithographic transfers as guides for wood engravers is extending itself in the printing trade, and it appears to us to be the best method of securing a photographic image on the engraver's block. It is quite possible to secure a transfer which shall exhibit a considerable amount of half-tone by the ordinary process with gelatinised paper, and such a modified process as that which we described in our leader of the 13th instant will give excellent results in careful hands.

Portraiture by Artificial Light.—The use of ordinary coal gas as a photographic illuminant appears to be exciting much discussion, and its practicability is now thoroughly demonstrated. The ease with which the light can be got into working order, and the fact that expense is only incurred while it is in actual use, are among the most attractive points of the method of illumination in question; but it cannot be denied that the light is rather less actinic than one would like it to be. A paraffine lamp gives a much whiter and more actinic light than gas, and there is no difficulty in arranging a battery of such lamps by soldering the wick-holders into the top of a flat metal cistern. We have occasionally used such an apparatus for heating purposes, and have found the light from it to be remarkably intense and actinic. It may be worth while for those photographers who wish to work during the night to make some experiments in this direction.

Apparatus for the Million.—Mr. Stone is the architect of a quarter-plate camera, with screw adjustment for focussing, and rising front; which, lens and all, can be sold for five shillings. There is nothing improbable in this, and such a cheap apparatus would doubtless cause many new amateur workers to enter the field. The toy-makers, who principally live out Whitechapel way, would no doubt cooperate with Mr. Stone in the commercial production of his apparatus. It is quite a mistaken notion to believe that very expensive apparatus is essential for the production of good photographic pictures. The low rate at which commercial dry plates are now sold is surprising, and surely the profits must be extremely small; yet we have seen some very excellent pictures which were taken on the lowest priced plates.

At Home.

WITH PROFESSOR LISTER, F.R.S., OF KING'S COLLEGE HOSPITAL — PHOTOGRAPHS OF BACTERIA.

The camera has so frequently proved itself of value in scientific research, that there may seem little call to chronicle one more investigation that has been brought to a successful issue by its aid. In astronomy, and medicine especially, has photography proved particularly useful; to-day no observatory is complete without its camera, while the surgeon and the physiologist alike use the sensitive plate as an ordinary means of recording phases of interest. It was but the other day we called attention to the interesting pulse records of Dr. Luys, made by means of camera observation, while we recently described in this journal a photographic establishment in Paris, whose sole duty it is to watch and record the progress of diseases by means of photography.

But we have here to speak of a far more important application of photography than these. It is one likely to establish the truth of the most useful clinical question of the day, a matter which has already revolutionised surgery, and appears calculated to bring with it advantages and blessings as great as those which followed the introduction of chloroform and anæsthetic treatment. Mr. Lister, F.R.S., the well-known surgeon of King's College Hospital, and one of the foremost operators of the present day, conceived the idea that disease and death, which unfortunately follow so many surgical cases, are, for the most part, to be prevented by the adoption of certain specific means of treatment during and after the operation. Whether it is gangrene, pyœmia, relapsing fever, or any other well-known form of blood poisoning that supervenes and brings about a fatal result, they are, he says, in the hands of the surgeon to prevent. Mr. Lister's mode of treatment is now adopted in every hospital in London, and the result, we are happy to say, is, that the percentage of deaths after surgical operations has most materially decreased.

Mr. Lister's theory is, that these diseases are due to bacteria. Bacteria, in his opinion, are distinctly vegetable organisms, although some authorities claim them for the animal kingdom; be this as it may, they are tiny organisms of which the atmosphere around us is full. Spores detach themselves from bacteria, and develop into the full-grown organism. Wherever decomposition is going on, bacteria are at the bottom of it. Milk may be preserved sweet any length of time, if you can keep bacteria from going near it. "Like chemists," Dr. Tyndall once said, "they spend most of their time in effecting decompositions, and making smells." Whenever they get a chance—and they are ever hovering about seeking an opening—they at once set to work to bring about decomposition and propagate disease. All bacteria are small, and some of them very small. The largest we have seen, looking like tiny whip snakes, were three times as long as a blood corpuscle; the smallest are said by Dr. Child to measure 1-85000th of an inch. A blood corpuscle can just be recognised under a quarter-inch lens, and measures exactly 1-3200th of an inch; but bacteria are, as a rule, so minute that a lens of one-sixteenth or twentieth of an inch is necessary to examine them properly.

Surgeons, although they have adopted Mr. Lister's treatment, do not all of them adopt his theory. Since the air swarms with bacteria, you must get rid of them, Mr. Lister says, if you want to operate with safety. To do this, he washes operating knife and all his surgical appliances in carbolic acid; he operates in the spray of the same liquid; and the dressings are never applied or changed unless under these conditions. To open a knee joint, or indeed any other joint, is fatal under ordinary circumstances; under Mr. Lister's treatment the operation may be performed with success. Surgeons, therefore, all the world over are bound to believe in Mr. Lister's treatment; but as they are not bound to believe in his theory about the bacteria, they do not all of them do so, and hence his victory is only half complete. It is all very well to say that gangrene and pyœmia are due to bacteria, but if no one has yet observed these tiny organisms in animal tissue, how is such a theory to be supported? For, strange to say, the microscope, when appealed to, fails to bear out all Mr. Lister says.

A staunch friend has now turned up in most timely fashion, and this is the micro-camera. Its evidence is likely to afford convincing proof of the soundness of Mr. Lister's theory and practice. A colleague in Germany, Dr. Koch, has succeeded in taking photographs of bacteria in animal tissue, and this interesting series of pictures Mr. Lister was good enough to show us the other day. Look into the microscope, and you cannot see these bacteria in their bed of tissue; place them before a camera, and you secure a photograph of the tiny organisms forthwith. Here, then, is one excellent example the more of the utility of photography as a means of investigation; not only does the camera make successful search, but it records permanently what it sees. Our readers, we feel sure, will thank us for bringing before them so interesting an example.

To Dr. Koch we must give credit for the manner in which he has coped successfully with three difficult and delicate operations. There was the microscopic work, the staining of the tissue, and his photographic labours; and it was only by carefully carrying out all of them that he has been enabled to accomplish these wonderful results. But it will be asked, how, if these organisms cannot be seen in the microscope, is it possible to photograph them? We will endeavour to explain. To the eye a slice of tissue represents a transparent body. But two objects, although transparent, may have different refractive power. Bacteria in animal tissue is a case in point. Bacteria consist of protoplasm, but not so tissue. You may heighten this refractive power in mounting. If you employ glycerine or weak spirit for mounting you do this, but not so when you use Canada balsam. In fact, you may place these three bodies in the following order:—Canada balsam, glycerine, and weak spirit, the last increasing the rafractive power in the greatest degree; or you may do as Dr. Koch has done, employ aniline violet or other suitable colour for staining your microscopic object, and thus heighten the refractive power. But even in these circumstances it would appear that while the difference in refraction is enough to impress a sensitive plate, it is inappreciable to the eye.

We do not know the nature of the instrument employed by Dr. Koch, but it must have measured somewhere about one-twentieth of an inch, and was, Mr. Lister informs us, an immersion lens; the immersing of a lens permitting one to concentrate the light more effectively. The photographs are transparencies executed in a most perfect manner, and capable of being thrown upon the screen at a lecture for instructional purposes. They represent the animal tissue of mouse, rabbit, &c., after the animal had been punctured with a needle to permit the entrance of bacteria and the spread of blood poisoning. Let us examine the first of the series. Here are little round globules hanging thickly upon threads of cobweb, like tiny currants or grapes; they are the bacteria of the deadly gangrene, and as they advance all hope for the patient dies away. Here, in the next slide, is the articulated bacteria, like a tape worm or bit of jointed grass; and here the thin hair-like organisms that are the cause of relapsing fever. There are a score of pictures in Dr. Koch's series, and they all have their vital—or shall we say deadly?—history. The spores of the bacteria are even more minute. "You can maintain bacteria alive," says Mr. Lister, "in mucus from the eye, carefully kept at blood heat; and under these circumstances they will detach spores, which afterwards develop a cilium." But these photographs of Dr. Koch seem to teach us more about bacteria and their terrible functions than any other scientific investigation that has been made in connection with the tiny organisms. Not long ago Lionel Beale, one of our best authorities on the microscope, wrote: "Any of the markings on diatoms that are visible with the microscope can be photographed with the utmost clearness and ease, and the time has arrived when the inability to photograph alleged markings will throw doubts on the correctness of the observers who have supposed they saw them." We have gone far beyond this; we now observe, by means of the micro-camera, objects unseen by the eye.

The "At Home" next week will be "With Dr. Hermann Vogel and his New Emulsion."

HYDRO-KINONE AS A DEVELOPER.

BY DR. J. M. EDER.

Captain Abney's proposal to employ hydro-kinone as a developer* deserves all attention. Some experiments made by Herr Haack and myself, soon after the publication of his

* See Photographic News, page 345.

proposal, have given results of a very favourable nature. We find hydro-kinone development may be employed for gelatine emulsion plates with considerable success. It answered best in our experiments when from two to four drops of ammonia were added to 25 cubic centimetres of the aqueous hydro-kinone solution. We may preface our remarks by saying that a two per cent. solution does not develop more rapidly nor with the same energy as the ordinary pyrogallic developer; in fact, of this strength it presents no advantage over the latter; but a stronger solution exhibits many advantages.

For comparison with a four per cent. hydro-kinone developer, a pyrogallic developer of the following nature was prepared:—

Water	50 cub. cents.
Pyrogallic solution in alcohol (1 : 10)	1 cub. cent.
Bromide of potassium solution (1 : 10)	1 „
Ammonia	2 drops

Very sensitive bromide of silver plates were experimented with, and the result with these was certainly in favour of the hydro-kinone. For this latter developer only from $\frac{3}{10}$ to $\frac{5}{10}$ of the exposure necessary for the pyrogallic developer was requisite. The image appeared more quickly, and of a more energetic character, than under the action of the pyrogallic solution, and exhibited no trace of fog.

By employing a six per cent. solution of hydro-kinone the exposure may be made still shorter; in this case also no trace of fog occurs in development.

The hydro-kinone developer acts with much clearness, and does not require any addition of soluble bromide as a restrainer. One must, indeed, be extremely careful in the matter of adding bromide of potassium. The hydro-kinone will not bear so much bromide as the pyrogallic; not so much even as the ferrous-oxalate developer. A few drops of bromide of potassium solution added to the hydro-kinone solution robs it of nearly all its developing power; the image appears in these circumstances weak, thin, and imperfect in the highest degree.

The hydro-kinone developer produces fog only in the event of too much ammonia being added; in this case the solution becomes of a greenish brown colour, a tint that is imparted to the gelatine negative.

Negatives developed with hydro-kinone possess great brilliancy. The colour of the film is blackish, and is easily to be distinguished from negatives developed with ferrous-oxalate or pyrogallic. Plates produced by pyrogallic development are of a yellowish brown; ferrous oxalate gives a bluish black film, while a hydro-kinone negative is of a blackish-brown colour.

Hydro-kinone therefore possesses many practical advantages. At the same time I must remark that the shortening of the exposure is only then of a marked nature when we compare hydro-kinone with the ordinary pyrogallic developer. Compared with a very powerful pyrogallic or glycerine developer, the reduction in the exposure is no longer so remarkable. I scarcely think that we can hope to introduce hydro-kinone for general work at its present high price, since its advantages are not of sufficient importance to warrant us in purchasing so costly a compound. In the meantime, however, we must recognise its excellent qualities as a new developer, and bear it in mind in the event of its being some day produced at a cheaper rate. As soon as its high price stands no longer in the way, the hydro-kinone developer will be frequently used, and find many friends.

SENSITIZED PAPER IN INDIA.

BY W. T. WILKINSON.

I have had sensitized paper sent out to me in India, and in each case, when properly packed, it was as good as paper freshly prepared.

Sensitised paper for India ought to be made bone dry; the tin case should be quite air-tight, and warmed before the dry paper is placed within it. The case should then be soldered up thoroughly. If these precautions are taken in England, and upon arrival care is taken to keep it dry, no difficulty at all will be found in getting good prints. I can thoroughly recommend the formulæ published last year by Mr. Blanchard for preparing paper that will keep. I have kept paper so prepared for over three months, so that in one evening it is possible to sensitise paper sufficient for a long time.

About unvarnishing a plate, gelatine or collodion, nothing is so good or efficacious as

Methylated spirit	1 ounce
Saturated solution of pure caustic potash	1 drop

Flow this mixture on and off the plate until the thick line (at the end the varnish was poured off the plate) disappears, then rinse with spirit once or twice, and wash the plate well under the tap; by this treatment the varnish is entirely removed without rubbing, and without danger to the film.

I can endorse Capt. Turton's advice to his Indian friend about the gelatine plates and washed emulsion, but would say that care must be taken, in using gelatine plates, to employ plenty of ice during development, and also for the water used for washing.

I shall not forget in a hurry my first attempt at developing a gelatine plate. A dozen were brought in by a gentleman just arrived per steamer, and I was asked to develop them. Solutions were made up with *iced* water, and also placed in the ice-chest: everything went well with the first until washing after fixing, when all at once away went the film, leaving the plate quite clean. Upon testing the washing water in the cistern, I found it over 80°, so sent out for a sixpenny block of ice and finished the remaining eleven plates without a failure.

THE PREPARATION OF ENCAUSTIC PHOTOGRAPHS.*

When the weather is dull, and especially on wet days, difficulties due to long exposure will present themselves, but they may be avoided by judicious developing. The glass plate is coated with chromatine,† dried over the spirit lamp, and, while still warm, placed with the transparent positive (also warmed) in the copying-frame. If now the exposure be a long one, and the atmosphere be damp, the hygroscopic substances contained in the chromatine will attract so much moisture, that when the colour is dusted on, the whole film will be blackened. To prevent this, the film must be thoroughly dried by gradually and gently heating, and then allowed to absorb moisture from the air for a few minutes. At the first dusting only a weak and thin picture will be developed; the plate must, therefore, be allowed to stand for a minute, and the colour be again dusted-on. Should the prints still be not sufficiently vigorous, this operation must be repeated again and again until the required effect is obtained. After each dusting the image will become more vigorous, and at last it will appear fine and clear. If the dusting-on be carelessly performed on the moist film, fogging will inevitably be the result.

Smearing in the lights is caused either by insufficient exposure, or by moisture in the brush, in the colours, or in the film; it may also be due to a forced development when the plate has been over-exposed. Care must, therefore, be taken to avoid errors in the length of exposure, and when the weather is damp the plates, the colours, and the brushes should all be well dried before developing, and the drying should be repeated at intervals of a few

* Continued from page 400.

† Under this name are known the various solutions for the preparation of which formulæ have been given.

minutes. The operator must not trust to being able to clear up the lights by the use of hydrofluoric acid, or by strong firing, and he should remember, when developing, that the whole picture becomes lighter in the furnace.

When the image is sufficiently developed, all superfluous colour which still adheres to the plate must be removed with a broad and perfectly clean dusting brush, taking care, however, not to press the brush too closely, or it will take off some of the powder which has been properly fixed. Before fixing, it is now necessary to remove the remaining soluble chromates by washing, but before doing so the picture must be protected by a coat of collodion. When the picture is to be burnt-in on the glass plate itself, ordinary collodion containing 1·4 per cent. of pyroxyline may be used; but when some other kind of support is used, as an enamelled plate, or an object in porcelain, it becomes necessary to transfer the picture. For this purpose leather collodion, or collodion containing castor oil, is employed.

Let us assume that we have to fire the picture on an enamelled copper plate. Take a porcelain basin and fill it with a two per cent. solution of caustic potash in water. This solution serves the purpose of removing the last trace of chromate from the film; it should be made fresh when required, as, when exposed for any length of time to the action of the air, it becomes spoiled. The plate with the picture in encaustic colours is now well dusted, and a coat of leather collodion—that is, ordinary collodion containing 1·5 per cent. of pyroxyline, to which twenty-five drops of castor oil per litre have been added—is flowed over it. So soon as the film of collodion is set, it may be detached along the edge of the plate with the finger-nail, leaving, however, the picture of such a size that there will be sufficient of the film to turn over the edges of the enamelled plate. The glass plate with the picture is then laid in the potash solution, where it must remain until the yellow colour has entirely disappeared. If it be not kept long enough in the alkali, the picture when burnt-in will have a greenish yellow tinge.

After having been treated in this way the plate is next plunged into another basin full of pure water, and after a short time it is taken out again and laid on blotting-paper; the basin is then emptied, and filled once more with fresh water. To facilitate the removal of the film the collodion must be again rubbed off round the edges with the finger, and the plate once more plunged into the water. The film will then be found to detach itself from the plate and to float in the water. Now take out the glass plate, and with a soft brush turn the film carefully over, so that the collodion side is downwards. In doing this be careful not to injure or tear the film, and avoid the formation of air-bubbles, as in fixing they produce white spots.

The enamelled plate, after having been cleansed of any greasy particles and carefully washed, is then plunged into the water underneath the floating film. For performing this operation a fork made out of brass plate is used, which, when dipped into the water, does not take any air-bubbles with it. Taking now the fork, with the plate on it, in the left hand, dip it carefully underneath the floating film, and with a soft brush in the other hand bring the film in its proper position on to the plate while still under water. Then lift the plate with the film adhering to it slowly out of the water, and adjust the picture again, if necessary, with the finger; turn back any of the film hanging over the edges, and cut away any ragged pieces with a pair of scissors. Now lay the plate, with its picture side upwards, on blotting-paper, and let it dry. The collodion must everywhere adhere to the enamel; where it does not do so, the picture will in firing leave the plate, as it will also do if any parts should have been allowed to remain greasy.

Instead of, as above described, inverting the picture in the water, it may be left with the collodion film upwards, but then some adhesive material must be used; this purpose is answered by a solution of one part white sugar in four parts water, boiled for a few minutes, and then filtered. The glass plate with the collodionized film is dipped into a porcelain basin filled with this solution, and the film with the picture is detached and transferred to the enamelled plate in the same way as already described. Before fixing the plate must be dried thoroughly at a gentle heat.

Burning-in the picture is effected in a muffle furnace. The heat must be considerable, of a cherry red colour, and equally distributed over the whole of the muffle. A strong fire should be kept up over the muffle, and a gentle one underneath. When the furnace is first lighted the picture should not be inserted so long as any flame is visible in or over the muffle; when fresh coke or charcoal is introduced the presence of a slight flame is no longer dangerous. After the door of the furnace has been kept closed for some time, the interior will become white and glowing; while this is the case the picture must not be inserted, but the operater must wait until the heat has sunk to a cherry red. During the process of firing any access of cold air to the enamelled plate must be carefully avoided, and on that account, before it is inserted in the muffle, the air-hole of the furnace, as well as the doors of the room, must be kept closed.

In the muffle is put a circular ring of clay, and on it is placed a hollow hemisphere, also of clay; on this, as upon a pivot, can revolve the disc on which is laid the enamelled plate. A circular disc of fire-clay is now taken in the tongs, covered with powdered chalk, and placed in the hemisphere until it is hot through and through; it is taken out again, the enamelled plate with the picture in encaustic colours laid on it, and then again inserted in the muffle.

The process must now be carefully watched. Very soon the collodion film will be seen to burn, and the picture vanishes, only to make its appearance again in brilliant places—a sign that the colour has melted. Now turn the disc carefully round, so that all sides may become equally exposed to the heat, and when the picture assumes everywhere the same brilliancy take it at once out of the muffle; on no account must the firing be too long continued. A beginner who is not practised in the use of the furnace should remove the plate occasionally from the muffle, and view it by daylight; so long as the deeper shadows appear dull, the melting of the colour is not completed. Every time that the disc is taken out of the muffle it must be placed on a warm tile, that it may not cool too quickly. A few minutes after it has been finally removed, the enamelled plate may be taken off the clay disc with a spatula, and laid on a cold support, and the firing of the remaining pictures can then be proceeded with. Should the plate, notwithstanding the presence of the chalk powder, stick to the disc, it may be detached by a sharp blow when the whole has become quite cold.

Burning-in pictures in encaustic colours on porcelain is effected in exactly the same way, but before firing the image must have a solution of borax flowed over it, and then be dried.

It is mostly necessary to spot or retouch the picture after it has been burnt-in; for this purpose take a small quantity of the encaustic colour which was used for dusting-on, mix it with oil of turpentine or of lavender to a thin paste, and apply it with a fine brush. The object which has been retouched is then laid on a warm tile to dry, and afterwards again dried. In the case of portraits, it is the practice to lay on a background of encaustic colour of a somewhat colder tone, which produces a very harmonious and artistic effect.

To make the picture more brilliant it is coated with a flux; this flux consists of—

Powdered glass	8 parts
Saltpetre	5 ,,
Flint	6 ,,

Or,

Borax	4 parts
Minium	4 ,,
Flint	1 part

The flint is thrown red hot into water, and rubbed to powder. A flux of this sort can be obtained in the shops ready made; its application can be effected in several ways. (1.) A thin solution of caoutchouc can be flowed over the picture, which is then allowed to dry; the flux is dusted on with a brush, and then burnt-in in the muffle. (2.) Borax solution can be substituted for that of borax. (3.) So much of the flux as will lie on a florin is rubbed up in a mortar with fifteen cub. centim. of spirits of wine, and then shaken up with fifteen cub. centim. of non-sensitive collodion. After the collodion film has burnt off in the furnace, the picture is allowed to get cold; then the mixture of flux and collodion is flowed over it, afterwards drained off, and the last drops removed with a piece of blotting-paper, for if they were allowed to remain they would cause a light-coloured spot. When it is dry, the enamelled plate is replaced on the clay disc, and inserted again in the muffle; here the flux very soon melts, and gives to the picture a beautiful and evenly distributed brilliancy.

HOW TO WORK PAPER SUCCESSFULLY.

BY H. A. WEBB.*

By working paper successfully, I mean the obtaining of uniformly good results; not good one day, and bad the next. In order to do this, we need, in the first place, paper that is in a uniform condition; for without this, we need not expect to obtain work with any degree of uniformity.

The first question that arises is: "In what particular is the paper of any one brand the most likely to differ?" A solution of this question will be a step in the right direction. If we go back to the albumenizing of the paper, we find that it is always salted the same (the albumenizer can easily control this, and he understands the importance of having it salted the same); so we need hardly expect to find a difference here. The albumen can be maintained at the proper consistency; if it is not, it will be detected by the appearance of the albumenized surface. Now, if the paper is salted the same, and the coating done uniformly, we very naturally expect to find it work uniformly; but that such is not the case, we very often find, to our discomfiture. There is but one other condition of the paper (that I can see) where there can be any great difference, and that is in its degree of humidity; and it is here, I think, that much of our trouble lies.

Let us look at some of the influences at work governing the condition of the paper in this particular. In order to do this, we must consider the nature of albumen in so far as it will be affected by these influences. One very important characteristic of albumen is, that it will absorb moisture quite rapidly when placed in a damp atmosphere, and will just as rapidly part with it when removed to a dry atmosphere. So we see that albumen paper is continually changing, as one or the other of these conditions of the atmosphere is changed. When we consider the innumerable changes of atmosphere to which the paper is subjected, it does not appear strange that difficulty will arise in the working of the paper, if some attention is not paid to the condition of the paper in this respect; and very often paper is condemned when all that it needs is to be placed in a damp atmosphere for a short time previous to silvering. This is most likely to occur in winter time, when there is fire in every place the paper is kept, and every particle of moisture dried out of the atmosphere and paper. The keeping of the paper damp has been recommended from time to time, but the great importance of it has not been sufficiently impressed to secure the general practice.

* From *Philadelphia Photographer.*

The paper should be sufficiently damp to lay flat upon the silver solution without curling, and when in this condition it is not only much easier to work, but it will take the silver more evenly, and require shorter floating.

It may be that some will ask how they can keep the paper in this condition, when no suitable place is available, such as a basement or damp room? A very simple yet effective plan is to construct a box about 20 by 24 by 8; then have a false top for this made of laths, and to set in about an inch from the top; on these laths are placed several damp blotters, and as the atmosphere becomes damp it settles down upon the paper, and keeps it just right for silvering; one end of this box is hinged, so that it can be dropped down, and the paper taken out as needed, either sheet by sheet, or the quantity that is required taken out at once, without having to remove the top and blotters. I have constructed a box like this, and found it to work very satisfactorily.

Having considered what was needed, so far as the paper is concerned, let us turn our attention to the silver bath. Here I would first of all call attention to a mistake that is frequently made, and that is, trying to get along with too small a quantity of silver solution. It is not economy, but just the reverse. And much waste and worry may be attributed to this cause; for, if we try to work a small bath, it is continually changing and getting out of order; while, on the other hand, if we use a large bath, the change in strength and other conditions of bath, caused by silvering twenty or thirty sheets of paper, is scarcely perceptible, and consequently the paper will work more uniformly. The quantity of solution required will be governed by the amount of work to be done. If twenty or thirty sheets of paper would be required each day, I would not advise a less quantity than one gallon—even one and a half gallon would be better. I make up the required quantity of silver solution at forty grains to the ounce, and add sufficient solution of carbonate of soda to make it slightly alkaline; shake it well, and allow it to settle. The precipitate of carbonate of silver I allow to remain in a bottle, decanting off the clear solution.

A very good plan to adopt in commencing a new bath or silver solution is to take a sheet of paper and tear it in quarters; float thirty, sixty, ninety, one hundred and twenty seconds; be careful to mark upon each piece the length of time floated, and no doubt one or other of these will be right. The condition of the paper, I think, will govern the time of floating as much as the strength of the solution. If it prints measly or weak, it is under-silvered—needs longer floating; if it prints strong, but yet has a sunken-in appearance, then it has been floated too long; if, when floated long enough to get rid of measles, it yet does not print vigorous, the bath is too weak; if the paper turns yellow, and prints too strong, then the bath is too strong; but if the paper prints brilliant, and slightly bronzes in the shadows, then the silver is the proper strength, and the floating sufficient. I always use a glass rod, and prefer it to any other way of working. The size of the rod the most suitable is about half an inch in diameter.

A word about floating may not be out of place here. The plan I have adopted is, I think, the easiest and most practicable way of getting rid of any bubbles that may have formed; instead of lifting up one corner at the time and breaking the bubbles, or touching the paper lightly upon the back and driving the bubbles out, as is frequently recommended, the sheets should be removed from the solution by taking hold of the two front corners, and raising until it clears the bath; if this is done immediately after the paper has been laid down on the solution, it will have expanded just sufficient to curl up a little at the back, and so allow the paper to be replaced without the edges dipping under, and it will be found that all the bubbles will disappear.

(*To be continued.*)

The Photographic News.

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THE FORTHCOMING EXHIBITION.

One month, precisely, from to-day, all pictures destined for the Autumn Exhibition must be delivered at the Gallery, No. 5A, Pall Mall, East. The rules and regulations of the Exhibition do not materially differ from those of past years, and are sufficiently well knowu to our readers. The Hanging Committee possess the right of excluding any pictures or apparatus they think fit, and this right will no doubt have to be exercised, seeing that gelatine plates have given a surprising impetus to work, both among professional and amateur photographers, and a far more numerous collection of works may fairly be expected. In these circumstances the r gulation that provides for the reception of pictures up to 9 p.m. on Friday, the 24th prox., will doubtless be strictly adhered to, and we commend punctuality to all those who have no desire to suffer disappointment. Three or four years ago, upwards of 300 frames were unhung by reason more particularly of want of space.

The Exhibition opens to the public on Monday, the 4th October, and closes on the 13th November. Members of the Society and their friends will, however, be permitted to view the pictures on the Saturday previously, when the usual conversazione will be held at 8 p.m.

In respect to exhibits we may state that all photographers, whether members of the Society or not, are invited to send pictures to Pall Mall; and they will stand on the same footing as members of the Society as regards the admittance of their work. But they will be charged a small fee for wall space—at the rate of one shilliug per square foot —to cover incidental expenses. Foreign photographers are, however, exempt from even this slight charge, and "will for the occasion be considered honorary members."

Medals will, as in recent years, be awarded "for artistic or scientific excellence" by a body of judges whose names have already been published, and indeed the only new regulation that this year comes into force is one relating to the purchase of the pictures exhibited. This will be important to many. Complaints have frequently been made about the difficulty experienced by intending purchasers in getting at the price of pictures that take their fancy, for although the catalogue usually gives the address of the photographer, people are diffident in their overtures until they possess some information about the price of a picture. This year everyone who desires to do so will be able to notify to visitors particulars of this kind, the price of the pictures being included in a special catalogue that will lie on the table for reference. Those who wish to avail themselves of this privilege, say the regulations, "will please state the price of their pictures in the letter of advice."

INSTANTANEOUS PHOTOGRAPHY.

The general employment of the gelatino-bromide process by photographers of almost every grade is likely to inaugurate a new era as regards the photographic delineation of those scenes of active life which it is the greatest triumph of the art-science to faithfully depict and to perpetuate.

Even with the rapid plates now in the hands of the photographer, and the optical aids to rapidity which opticians have placed in his power, the occasions when it is practicable to obtain fully-exposed and thoroughly satisfactory pictures of widely-extended scenes of active life are comparatively rare. A bird in the act of flying, or a sailing yacht bent over towards one side by the force of the wind, is not, perhaps, so difficult to secure as might at first sight be imagined. There are generally times when objects of this nature almost pause in their movements, and it frequently happens that the moving object forms the central feature of a view, while its surroundings are of such a nature that extreme definition can be dispensed with. Under these circumstances, lenses of large aperture may be employed; say, a portrait combination working at $\frac{f}{4}$ or $\frac{f}{5}$, and yet a highly satisfactory definition be obtained, especially if the distance of the object is so great that it does not subtend a large angle to the lens.

The practical difficulty of obtaining fully-exposed views of really difficult subjects, is well illustrated by the small number of thoroughly satisfactory pictures which are shown in photographic circles, and the numbers of these which have been handed round at the meetings of the Photographic Club during the present season might easily be counted up on the fingers of one hand. The prevailing desire among a large section of the London amateurs appears to rest in the production of sharply-defined silhouettes of steamboats; and these are examined by means of magnifying glasses amid expressions of wonder and admiration as the name on the stern is made out; or as an annouucement on the paddle-box, explaining that the *Daily Telegraph* has the largest circulation iu the world, is deciphered. Notwithstanding its sharp definition, the photograph is generally so wofully under-exposed that it, together with its surroundings, recalls the idea of a severe thunderstorm, or of a Satanic steamer far down in those depths which have been so ably illustrated by Doré and other artists. Many of the steamboat photographs referred to would have required at least a sixteenfold exposure in order to elevate them from the condition of black silhouettes to the position of properly exposed photographs, and if this increased lighting had been attained by the use of an aperture three times the diameter of that employed, in conjunction with a nearly double exposure, the results might have been calculated to give pleasure to an artist, although, perhaps, the photographic purist might not have found very much upon which to exercise his magnifying-glass.

Apart from all questions regarding an artistic selection of the subject, the first and foremost condition for the production of a picture by photographic agency is an exposure sufficient to secure all the various gradations of light and shade of the original. Unless all these gradations of light and shade are represented with tolerable fidelity, the photograph loses its position as a picture, and descends to the level of a diagram. The picture is of especial value as a means of art culture, while the photographic diagram is often of great value for technical, legal, or industrial purposes.

In producing an instantaneous picture by photographic agency, the first point to be attended to is the proper lighting or exposure of the plate, as if this is insufficient, the result of the work will be altogether valueless. The maximum time of exposure which can be given having been roughly estimated, and the shutter adjusted to the required speed, the next point is to determine what is the smallest aperture which will allow the necessary amount of light to fall on the plate. Should the conditions of light and proposed speed of exposure necessitate the use of a large aperture (say, $\frac{f}{3\cdot5}$ or thereabouts), a portrait combination must be employed; while under more favourable circumstances a lens of the symmetrical class will naturally be preferred.

As an illustration of some of the conditions iucident to a rather difficult case of instantaneous photography, let us suppose that the camera looks somewhat obliquely down a wide street crowded with a mixed traffic of foot passengers and vehicles, bright summer sunshine illuminating the whole. In such a case, provided that a time is selected when there are no objects quickly moving across the field of view, and there is nothing in rapid motion very near to the lens, au exposure of from one-tenth to oue-fiftcenth of a second may very well be given; but if, on the other hand, the full activity of street life is to be represeuted, and a time is to be selected when objects are in such position as to most severely test the rapidity of the exposure, it will be found impracticable to work with a much longer exposure than a one-hundredth part of a second. When the conditions of light are favourable, it is possible to obtain a fully-exposed picture in the tenth or fifteenth part of a second with a symmetrical lens having an aperture of $\frac{f}{8}$ to $\frac{f}{10}$ or in some cases with a mnch smaller aperture; while in a comparatively dull light the exposure mentioned will prove sufficient if a portrait combination with an aperture of $\frac{f}{3\cdot5}$ is made nse of. Where, however, the desire to represent rapidly moving objects in the foregronnd necessitates the reduction of exposure to $\frac{1}{100}$th of a second, or thereabouts, it is generally necessary, even when the light is intense either to make use of a portrait combination working with a tolerably large aperture, or to put up with an under-exposed plate which will require so forced a development as to destroy every good quality, which an artist would most look for. Supposing that the time of exposure to be giveu must not exceed $\frac{1}{100}$th of a second, and it is estimated that a full exposure can only be given by the use of a diaphragm having an aperture equal to $\frac{f}{5}$; the next step is to so place the camera that the building shall approximate to the lens at the edges of the subject as to compensate to some extent for the curvature of the field, the marginal rays being thus lengthened out inside the camera. The next point is to determine the position at which it may be desirable to secure the greatest sharpness, and after this to fix the limit of sufficient definition as regards nearness to the lens; while extreme detail in the distance is neither to be expected nor very much desired. The operator now waits, not for rapidly moving objects to move out of the immediate foreground, but for them to arrive or accumnlate there. It must be distinctly understood that we by no means undervalue the importance of fine detail and definition all over the field; but we deprecate the sacrifice of those delicate modellings and infinite gradations of tone which build up a true picture, to a microscopic detail which can only be fully appreciated by those who carry magnifying glasses. When a certain exposure allows an inartistic silhouette or outline to be produced by forced development, it may generally be estimated that sixteen or twenty times as much light would be required to impress a similar plate sufficiently to make it yield a properly exposed and fully modelled negative by a normal development.

Notes.

It seems bnt the other day that the existence of bacteria was under discussion, those tiny organisms that fill the air and are for ever floating around us. Now a clever microscopist, Dr. Koch, has succeeded in taking their portraits in the camera.

Dr. Koch's marvellous work is described on another page, and there is no need, we are sure, to invite the special attention of our readers to it. Photography has helped medical science frequently before, but has never stepped in more opportnuely, nor afforded more valuable information. Dr. Koch's micro-photographs prove pretty plainly how patients who succumb to surgical operations come by their death; and to be forewarned is to be forearmed.

We have compared pictures of the spectrum taken upon gelatino-bromide and upon a film of Dr. Vogel's emulsion, in which, as our readers are aware, there is both gelatine and pyroxilin. The characteristic properties of Dr. Vogel's plates are less sensitiveness for the blue, and greater sensitiveness for white; in other words, an instantaneous exposure of his film gave a spectrum image as far as F, while the gelatine plate rendered the spectrum image only as far as E.

Messrs. Wratten and Wainwright have so much difficulty in preparing gelatine plates during hot weather in the daytime, that the work has lately been carried on almost entirely at night. The workpeople begin their labours shortly before midnight, and give over at six or seven in the morning.

The latest feat in instantaneous photography is a picture of the "Flying Dutchman," the well-known West of England express passing through Twyford station at the rate of some sixty miles an hour. The photograph is by Messrs. Marsh Brothers, and was secured on a Fry plate.

Unfortunately, the train is in a cutting, just emerging from nnder a bridge, its smoke and steam rising against the structure; the cousequence is, there is no suggestion of speed at all, and hardly any proof, indeed, that the train is moving. To secure the full idea of motion the train ought to have been rushing along an embankment, the head of steam flowing behind in a parallel line, and some semblance of flutter in the window-blinds of the carriages perceptible.

In the practice of photo-lithography a velvet roller will be found a most useful implement. After the transfer ink has been rubbed upon a stone slab with the ordinary leather roller, the thin layer of black cannot be more delicately transferred to the soft swollen gelatine print than by employing a velvet surface. The finest lines in the bichromate print are in this way properly inked, without showing any tendency to clog.

Tourist photographers going abroad do well to make up their dry plates in small parcels, in order to pass the Customs without difficulty. It is rare now-a-days that a searching inspection of a passenger's luggage is made, but as packets of glass weigh heavy, they are likely to beget suspicion in some quarters. It is best frankly to declare the nature of one's luggage to the Customs officer, and if you have but half a dozen plates in one package, he can feel the glass from the outside, if he is desirous of doing so.

We have visited most Continental countries with dry plates and photographic apparatus, and speak, therefore, with experience. In France, Spain, Germany, Austria, Switzerland, Italy, Holland, Belgium, Denmark, Sweden, and Norway, we have had dealings with the Customs, and only on two occasions were we challenged. Once in Copenhagen we had to undo a packet of twelve plates, and to demonstrate that it consisted of three smaller ones ; but we failed to understand a further request that we would lay bare the plates themselves. The second occasion was on marching past Isola, the first Italian post over the Simplon Pass. There we had to set up camera and tripod' and demonstrate the working of the Warnerke roller-slide ; but it was only, as we found out subsequently, to satisfy the curiosity in novelties of the serjeant in charge, who was something of a photographer himself.

Gelatine films, travellers must remember, are more susceptible to damp than were the collodion dry plates, and for this reason, if taken across the sea, particular care in packing should be observed. Lead-lined chests are usually prescribed for damp-proof packing, but lead-lined chests are hardly suitable for photographers in light marching order. What we have always employed with success, and have never found to fail, is thick tin-foil, or caddy tin, as it is termed ; this will keep out the damp sea air most perfectly, as well as dust and fine sand particles, since it closes tightly and firmly round the plate packets.

As oxalate development is rather more expensive than pyrogallic, some of our readers may like to note Dr. Eder's plan for recovering the most valuable ingredient in the solution, viz., the potassium oxalate ; it is done by the very simple process of precipitating the iron with potash, evaporating, and crystallizing.

Gelatine plates involve other changes in the dark-room besides that of illumination. Handy cupboards, where plates or emulsion may be put away in a moment when you desire to quit the room, have become very essential. The table drawer is an abomination, and the shelf—let it be in the most remote part of the laboratory—is not sufficiently protected. But shelves may be provided with flap doors, and thus furnish convenient hiding places ; or recesses can be made in bench or table, accessible by a sort of trap door, which is easily lifted whenever dark slides have to be provided with fresh plates. Much care and anxiety are removed from the photographer's mind if he has plenty of dark places of this kind at his disposal, for than there is less necessity for jealously guarding the dark room door.

Topics of the Day.

DEVELOPING DRY PLATES IN DAYLIGHT.

BY JABEZ HUGHES.

THAT *was* a startling advertisement of Mr. Morgan's about a couple of months since, "Another revolution ! Darkness abolished ! ! The most sensitive dry plates developed in the open air without dark box or tent, and the process closely watched to its conclusion ! ! !" For months past the wisest men had been laying their heads together how to use with safety the faint glimmering through double ruby glass. The yellow windows that for years had done good service with the most sensitive collodion plates were now declared untrustworthy photographic mockeries, delusions, and snares ; and even the dark red light was proclaimed, in railway language, to be a signal of danger. Yet men with good eyes were unwilling voluntarily to surrender their sight, and, after being accustomed to produce photographs by light, they naturally objected to produce them by darkness. To meet the difficulty, that awfully mysterious instrument with the ghostly name, the spectroscope, was brought from the lecture-room to the dark room, and no illumination was considered safe unless it could pass a competitive examination with this photographic divining rod. Just at this juncture the startling announcement was made that this dreadful anxiety was unnecessary—that red, orange, and ruby glasses might be returned to the glaziers, the spectroscope go back to the laboratory, the stuffy dark rooms be widely thrown open, and our plates might be developed more easily, cheaply, and better in the open air and by pure daylight.

Had I read such a statement only a short time since I should have smiled, and recommended the advertiser's friends to take care of him ; but really my old-fashioned notions have of late received such violent shocks by what has been accomplished, that I feel almost inclined to believe anything. And, further, as I knew the advertiser to be really sane—that he was an old-experienced photographer, and a man of probity—I thought that, despite the apparent impossibility, there might be some truth in it after all. I remembered, too that a few years ago there came other sensational advertisements, also from Greenwich—these were from M. Lambert then—and how that I was one of the very few who derived very substantial advantage from the instruction I there received. I therefore determined to obtain the information as early as I could. I was the more induced because at that time I was not in a happy frame of mind about the illumination of my own dark room. Mr. Morgan kindly arranged an early appointment, and, at the last moment, I was fortunate to secure the company of another seeker of knowledge—Mr. Cobb, of Woolwich, himself, perhaps, the earliest to abandon the silver bath, and who is, therefore, not only an experienced user of gelatine plates, but also a manufacturer of them. Mr. Morgan frankly explained that he intended to communicate full particulars of his "new method" to photographers, and to supply them with facilities for fairly testing it ; yet at that early stage there were matters of detail that were not determined. He was prepared, however, to state the principle and demonstrate the practice to us if we would receive the information under the seal of confidence, as he naturally wished himself to be the first to publish the particulars. Mr. Morgan having now in his book, and in a public letter, described his "new method," our lips are unsealed, and hence this narrative.

After taking our seats in the glass-room, and being introduced to Mr. Kidd, Mr. Morgan's co-worker and intelligent assistant, we were informed that the principle on which Mr. M.'s new method was based was so simple that we should probably smile when it was described ; and sure enough, after hearing it, we both burst into a hearty laugh, not at its absurdity, but at its simplicity and ingenuity.

Mr. Morgan explained that he had become a convert to ferrous-oxalate development, as distinguished from alkaline pyrogallic. He was conscious of its drawbacks, the trouble of frequently and carefully making up the solutions, the rapidity with which they decomposed, and their comparative expensiveness. Instead of giving it up on these grounds, he sought to remove them, and he had been successful. How he accomplished this will be seen as we proceed, as he showed his mode of working from beginning to end. He took an ordinary clear white glass dipping bath—not the usual greenish cast-glass one—and placed in it the proper proportion of a saturated solution of oxalate of potash, according to Dr. Eder's formula; next he poured in about an ounce of paraffin oil, which, not mixing with the oxalate solution, floated on the top, forming a layer of about a quarter of an inch in depth. He then added the proper proportion of saturated solution of protosulphate of iron, which, falling through the paraffin, formed at once the well-known brown-coloured ferrous-oxalate developer. This was stage the first, the formation of the developer in the vessel in which it would remain to be used, and mixing it so that from the very beginning it was protected from the air; thus the main cause of its decomposition was at once removed by the layer of oil which always floated on the top. A plate was then exposed in the camera, and removed to the ruby-lighted dark room. Here it soaked in plain water for a short time to thoroughly wet its surface, so that it might pass uninjured through the layer of oil, on the principle that oil and water never mix. It was then immersed in the developing solution in the white glass bath. The window was instantly opened, the pure air admitted, and, for the first time in our lives, we calmly watched the steady development of the photographic image in open daylight; the non-actinic colour of the developer entirely protecting the plates, while the transparency of the solution permitted the gradual development of the details to be observed much better than by the usual light of the dark room.

Here, then, was a remarkable phenomenon manifest before us—a new photographic marvel, a fresh tenth wonder of the world—a solution performing, at one and the same moment, duties of exactly opposite nature, making evident the feeblest action of light on the plate while it had been in the camera, yet protecting the same plate from the infinitely more powerful action of light in the room. Hitherto one of the wonders of photography has been the mysterious manner that the developing solution discriminates where light has acted, and where it has not; but the wonder is amazingly increased when we find that the same solution may simultaneously be the abject slave of light, recording its minutest influence, and its powerful tyrant denying it power to act at all.

When the details of the plate were all out it was allowed a further time to acquire intensity, which could be considerably estimated by examining the plate through the mass of the transparent solution. The window was then closed, the plate removed, washed, fixed, washed again, and after careful examination was declared to be brilliant, soft, dense, and perfectly clear of any vestige of fog in the deepest shadows. Other plates were exposed and similarly developed in daylight with equally successful results. Mr. Cobb then suggested that as all these plates were prepared by Mr. M., it would be desirable to test how the method would answer with a another maker's. Fortunately he had brought a packet of his own with him, and with these the results were again a similar success. We had then freely to acknowledge that Mr. Morgan had proved his case—that plates could be developed in comfort and safety by open daylight. In answer to the appeal whether he had not established every point he had claimed, we re-read his remarkable advertisement, and examined the points seriatim. Divested of sensational phraseology, all the essential points were certainly established. In proof of the keeping qualities of the developer when so prepared, we were shown a bath that had been in use for a week or ten days, the solution of which had only the slight turbidity that would be acquired in half an hour by using the usual unprotected solution in an open dish, and the developing solution that we saw made up that day, and that we had used for some three hours, remained as clear and transparent as when first prepared. But there was one claim made, upon which we had no evidence—that the "method" permitted shorter exposure in the camera. Mr. Morgan's idea was that as the solution was so formed that it never had been in contact with the atmosphere, it must necessarily be more potent than when formed under the ordinary conditions. However feasible this might be in theory, we proceeded to test it by practice. A series of pairs of plates were carefully tried in succession, some being of Mr. Cobb's make, and others of Mr. Morgan's. The lens was stopped down to the smallest diaphragm, the same exposure given to each pair, and the timing was accurately made. One plate of each pair was developed by daylight in the ferrous-oxalate bath, the other with a standard alkaline pyrogallic made up under our joint direction, and developed by ruby light. The pyrogallic plates were developed in a shorter time, but so far as exposure in the camera was concerned there was no practical difference between them; and the ferrous-oxalate plates, which had everything as perfectly brought out in the least lighted parts and deepest shadows as the pyrogallic ones, but not more so, and each series of plates were developed to similar printing density, allowance of course being made for the two kinds of plates. Therefore this claim for permitting shorter camera-exposures we could not admit. To the question whether the new method was equally applicable to the alkaline pyrogallic solution, Mr. M. said he thought it was, but that probably a yellow glass bath would have to be used, or colouring matter, not injurious to the developer, might be added to the solution. He felt confident, however, that the ferrous oxalate, now that its objectionable defects could be removed, was so superior to alkaline pyrogallic that the latter must speedily go out of use when the superior merits of the other were fully known. This, however, together with the substitution of a more agreeable smelling oil than paraffine, were matters of detail to be further considered.

Our attention was then called to the "marvellously sensitive paper," and to some prints made on the same. The paper was stated to be coated with a preparation similar to the plates, but somewhat modified. We saw two pieces put under an ordinary negative and exposed in a printing frame, for a few seconds, to an ordinary gaslight distant some four or five feet. They were afterwards developed in a dish by a ferrous-oxalate developer, and were quite successful. The prints were scarcely as good as albumenised paper prints from the same negative, but were of nice neutral black colour, apparently well suited for enlargements. We saw no enlarged prints made on this paper, but as this subject appeared to be somewhat in the experimental stage, we were not called to express opinion, except so far as to the existence of such paper, and the readiness with which it could be employed where rapidity of printing was of moment. Mr. Cobb, who had experimented in this direction, doubted whether large sheets could be successfully prepared as a matter of commerce, but Mr. Morgan thought that he was on the fair way to conquer the difficulty, if he had not done so already.

Thus concluded a series of interesting and remarkable experiments, in the conduct of which we had the heartiest and most unreserved assistance from Mr. Morgan and Mr. Kidd. In answer to the request that we would pen a few lines expressive of our satisfaction, with the reservation already named, we wrote the letter that Mr. Morgan published. In leaving, our only regret was that Mr. M.'s arrangements were not sufficiently advanced to permit us at once making the same circumstantial statement as that now given.

As this article is chiefly narrative, I shall, in another one, give my own impressions and experience of this mode

of working, so far as I have partly carried it out, together with remarks, many of which were made at the time to Mr. Morgan, on the other workers in the same direction, especially Mr. Warnerke and Mr. Werge.

The "Topic" next week will be "Ceramic Photography," by J. R. Sawyer.

FRENCH CORRESPONDENCE.

Meeting of the Photographic Society of France—Photographic Spectacles—The Gelatino-Bromide Process in Marseilles—Mineral Collodion.

Meeting of the Photographic Society of France.—The last meeting of the session was held on the 6th of August last, and was adjourned until November next. In the absence of many of the members, who are taking their holiday, there were not many subjects of interest brought forward. Among the communications was a letter from M. Janssen describing the experiments he has made on the reversal of the photographic image by the prolonged action of light. If the exposure has been of the correct length, says M. Janssen, a perfect negative will be obtained; but if this length be exceeded, a positive will be the result; and if this exposure be still further prolonged, a general veil over the whole picture will be produced. By continuing to expose the plate, a second negative—or, as M. Janssen calls it, a negative of the second order—is obtained, the length of the exposure required to produce this secondary negative being a thousand times as great as that for the primary negative. If now the exposure be again pushed to a still further equal length, a positive will again result, then a clear neutral tone, and then again a third negative, succeeded by another positive, and so on. M. Dujardin presented to the meeting two fine prints of a portrait of Fox Talbot. At the instance of M. Davanne it was decided to send a copy of this photograph, accompanied by a biographical memoir drawn up by M. Stebbing, to each of the photographic societies in Great Britain. M. Stebbing exhibited, in the name of Mr. Cobb, of Woolwich, a number of prints from gelatino-bromide plates, and also a set of six photographs, carte-de-visite size, of a group of children in the various phases of having discovered a bird's nest, being scolded by their mother, required to replace the nest in the tree whence they had taken it, their longing and remorseful looks, &c.—all these emotions perfectly expressed, and the pictures exhibiting that artistic taste which prevails so extensively in England in compositions of this kind.

Photographic Spectacles.—At the same meeting M. Stebbing also exhibited, on behalf of one of our fellow-workers in London, Mr. Henderson, a pair of spectacles for the use of operators in the gelatino-bromide process. They are intended to protect the eyes from the sudden action of the light on leaving the dark room, where so many of the details of the process have to be carried on. These spectacles are similar to those made for wearing in the railway train; their frame has attached to it a fine wire gauze which fits into the eye. They carry ordinary white glasses, which are fixed, and in addition two smoked glasses, which move on hinges on both sides, and which can at pleasure be closed over the white glasses, or left open. Before leaving the dark room the operator takes care to turn the smoked glasses over the white ones; the light is thus much softened, and the transition from the nearly complete obscurity of the dark room to the dazzling light of day is deprived of its abruptness. There is no need to dwell on the advantages afforded by this contrivance; the service it is capable of rendering in protecting the eyesight is manifest.

The Gelatino-Bromide Process among the Photographers at Marseilles.—Being recently at Marseilles for a few days, I took the opportunity of inquiring how far the gelatino-bromide is employed among the photographers in that city. We have lately been enjoying an almost tropical heat in the south of France, and I thought it would be interesting to know to what extent the high temperature had interfered with photographic operations. To my very great satisfaction, I found the gelatino-bromide process in full swing among the principal photographers of Marseilles—Messrs. Cayol frères, Clado, Devos, Albert, Darrican, &c.; they are prosecuting it with great success, and are loud in praise of the wonderful results they are able to obtain. As regards the heat, they have not found it to interfere with their work. The only precaution they take is to wash the plates well in fresh water after developing and before fixing. Some of them prefer to harden the emulsion previously by means of alcohol. They have tried plates coming from many sources in France and England, with uniform success, the only difference being one of degree as regards sensitiveness.

A Mineral Collodion.—How often I have heard the wish expressed to be able to replace gelatine in the sensitive film by some other vehicle for the salt of silver! I observe that our esteemed colleague, Dr. Vogel, announces the discovery of a means of producing a sensitive film by an emulsion in which there is no gelatine, and it certainly will be a great gain to be able to dispense with a substance so capricious in its action.* The idea is, however, not a new one; in a work on photography by Garneri, published in 1861, will be found an exact description of a method for accomplishing this object. It consists in the production of a *mineral collodion*, by enclosing the silver iodide or other sensitive substance in a thin solution of silica, a very stable body. To obtain this result, a dilute solution of hydrofluosilicic acid is added to an also dilute solution of potassium or sodium silicate, until the mixture is neutral to litmus paper. A precipitate of alkaline hydrofluosilicate is found suspended in the liquid, the latter consisting of an aqueous solution of silica, which will remain perfectly fluid for several minutes; a few drops of a solution of an alkaline iodide are then mixed with it, and the whole is well shaken and filtered. There is thus obtained a solution of iodized silica, with which plates may be coated as with collodion; these are then placed in a horizontal position, and are fit for use so soon as the solution has assumed the consistency of firm jelly. When the plate has been sensitized, it can be dried and kept in the dark until it is required for use. This process, adds the author—and I am strongly of the same opinion—points the road to a new and highly promising field of action. There are many other substances, he goes on to say, which may be substituted for the collodion and albumen now employed in photographic operations, and our aim should be to produce from these sensitive films on transparent supports, until we are able to make a pellicle itself transparent, and capable of being detached and removed easily from the support on which it has been formed. This was written in 1861, and it is in all essential points as true at the present time as it was then. I merely point it out as a path good to follow in attempting to substitute for gelatine some more stable substance. According to Dr. Vogel the attempt has already been successful, and I can only wish with all my heart that he may be right.

Leon Vidal.

AN INSTANTANEOUS SHUTTER.

BY CAPT. ABNEY, R.E., F.R.S.

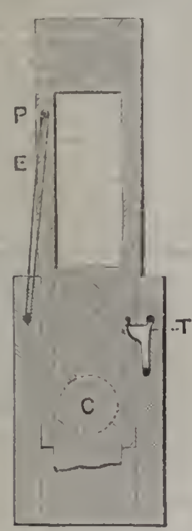
After trials with various kinds of shutters, I am led to the conclusion, alas! that there is no shutter which can give very rapid exposures which will not shake the camera to some extent. The movement may be very small, but it is none the less real. Any part of a shutter where it is released from its rigid connection, and consequently from the camera as well, alters the position of the centre of gravity of

* Our esteemed colleague is somewhat in error; Dr. Vogel's emulsion contains both gelatine and collodion.—Ed. P. N.

the camera, and hence a movement. If the camera be very weighty in comparison with the shutter, of course the movement will be barely perceptible ; or if the shutter drops or moves in the camera near the centre of gravity of the latter, the motion will be very small, but still it exists. After some thought regarding the matter, I came to the conclusion that a shutter, to be perfect, should not be in rigid connection with the camera, but separated from it, though it may be connected with it by a flexible material, so long as it is not supported by it.

To carry out my idea, I had a shutter made, which originally was intended to fit on to the end of the lens, and which I adapted to my purpose.

The form, as will be seen, is a drop shutter, the aperture of which can be shortened by a sliding piece of ebonite. The opening for fixing on the lens is shown by the dotted circle C. The total opening that can be given to the drop is six inches. At one side is a pin to which is secured a loop of elastic, E, which, when the shutter is ready for action, can be caught up by a pin, P. When the trigger, T, is withdrawn, the



elastic causes the aperture to pass rapidly over the circle C. By adopting this plan the full aperture of the lens is used during nearly the whole time of exposure, hence there is more light than when the length of opening is shorter, and where it drops by its own weight. This shutter can, however, be used to drop by its own weight by making the length of opening only four inches ; it then begins to fall two inches above C, and the total length of exposure is then the same as if the drop commenced just above the opening of the lens with an aperture of two inches. By this plan, though the time of exposure is the same as in the last case, the total light admitted is increased by at least one-half, which is an important point. The shutter when tried, when fixed on the lens, however, showed movement during exposure. To remedy this, round the circular opening of the drop shutter, and outside the flange, a conical bag of velveteen was fastened, an elastic band running round its other extremity. This bag was then carried over the lens, leaving the circular aperture of the shutter near the lens, but not in contact with it. To focus, the shutter is placed on the lens, and when exposure is to be made it is drawn off it, and held in one hand, the other hand being free to release the trigger. With this arrangement there is not, nor can there be, the least trace of shake in the resulting picture, and the inconvenience of the detachment is very small. The original shutter was an adaptation of Wratten and Wainwright's plan, which that firm carried out for me.

PLAIN PAPER PRINTING.

BY CAPT. F. W. TURTON, R.N.

In these days, when we hear so much about Art, and when etching and the lovely art of mezzotint engraving is being revived, why should photographers be so much in the rear ? Photography can do so very much, when artistically directed in black-and-white ; as in opal work it may (without the aid of any colour) make pictures to look exactly like neutral tint drawings, and in well arranged prints on plain paper rival fine mezzotint engravings.

The fine tones of the platinotype prints are quite in the right direction ; but the difficulty is at present to get the makers of ordinary sensitized paper to sensitize carefully some of their paper on the plain side—not the albumen side. I have made several trials of sensitized paper printing on the plain side, but unless the paper is *sensitized on that side* I find that it is very slow in printing, and does not stand out well. Mr. Werge sensitized me a sheet on the plain side, which printed much quicker and better, and did not sink in so much when finished. It would seem that if paper makers had some of these papers sensitized on the plain side, they would get a market for it among those photographers who desire to produce some rival work to fine mezzotint engravings.

The Photographic Co-operative Association are now sensitizing me some paper with this object, and I hope it may be successful. As regards opal work, a year ago I showed a little opal head of mine that had been exhibited at the Photographic Society to a French artist, who said: "That is a little neutral tint drawing." He was much suprised when I told him it was a photograph on opal toned with gold.

Correspondence.

APPARATUS FOR THE MILLION.

Dear Sir,—I for one shall be glad to see the "further particulars" offered by Mr. H. Stone on page 407, if he will favour us with them, and you will kindly insert.—Yours truly,
Richard Parr.

HYPOSULPHITE WASHINGS.

Sir,—It may interest your readers to know that I am using zinc plates to precipitate the silver in my hyposulphite washings. I used some time ago to throw them away, because they smelt so, but I now get a lot of residue out of them. I prefer zinc to liver of sulphur. I put two big zinc plates at the bottom of my tub, into which I pour the washings. Every week I collect the precipitate. If you think this worth while publishing, you may do so. How can I use my precipitate best—can you tell me?
A Vexed Printer.

[Our correspondent has scarcely discovered anything new ; neither, do we think, is he strictly correct in believing that zinc plates are preferable to liver of sulphur, which is generally employed by photographers. The liver of sulphur would probably abstract more silver from his baths, and do so more readily ; however, we will try the experiment. We should recommend him to get rid of his precipitate to a refiner ; it hardly pays a photographer to work it back into nitrate.—Ed. P. N.]

PHOTOGRAPHY BY GASLIGHT.

Sir,—My attention has been called to an error which has crept into your article on "Photography by Gaslight," in your issue of the 9th inst., respecting a model gas enricihng apparatus, and the London Argand burner, by Messrs. Sugg and Clarke, the well-known patentees. I think it right to inform your readers that the patent Mr. Clarke and I took out for the gas enriching apparatus was

given up months since, and has become void. The apparatus I patented subsequently is entirely my own invention.

In conclusion, allow me to acquaint you that I am the sole patentee of the London Argand burner.—I am, sir, yours truly, WILLIAM SUGG.

WOUNDS FROM DRY PLATES.

DEAR SIR,—A week or two ago, a correspondent of the NEWS pointed out what a blessing it would be if dry-plate manufacturers would but grind the edges of their plates before coating, and so guarantee an immunity from cuts on the fingers, from which he himself had suffered. Unhappy fellow-worker! I, too, have endured much, and can sympathise. An ardent lover of dry plates, my thumbs and forefingers "are profusely illustrated with cuts"—in fact, a mass of ghastly wounds, which do not heal, all derived from the cruel edges of the plates. Who, I ask, that has any delicacy of feeling (material, I mean) could refrain from uttering a protest, deep from the heart, against this unnecessary torture, especially at that agonizing moment when the ammonia runs over one's fingers, and a demoniacal tarantelle in the confined recesses of the dark room is expressive of one's feelings? 'Tis more than flesh and blood can bear! But why endure? Why this thorn among the roses? Why should a dry plate worker have to prove his glories won, like a warrior of old, by the number of his wounds? The correspondent referred to expressed his cheerfulness to pay extra for grinding the edges. I don't encourage that generous idea, because it seems to me a joke, with the laugh on the other side. On the contrary, I feel acutely that the makers ought to pay *me* for injuries inflicted, and if they will *not* in future grind the sharp edges of their treacherous plates, the least they can do is to include, with every box of plates sent out, a copious supply of sticking-plaister.—I remain, yours very faithfully,

A. J. F.

Talk in the Studio.

THE BRITISH ASSOCIATION AT SWANSEA.—The opening ceremonial of the British Association was observed on Wednesday evening, when the President, Professor Ramsay, delivered his inaugural address. As might have been anticipated, geology formed the chief topic of his discourse, which was listened to with deep attention. The Sections settled down to work yesterday, and we hope next week to report something of their doings.

PHOTOGRAPHIC ACTION.—A curious case was heard at the Shoreditch County Court on Tuesday last, in which a peripatetic photographer named Nelson sued the defendant, a Mr. Hewitt, of Stamford Hill, to recover the sum of £10 for alleged illegal ejectment. The plaintiff said he rented a piece of ground on the defendant's premises, at a weekly rental of 2s. 6d. He became several weeks in arrears, when he was summarily ejected, and he estimated his loss at the amount stated in his particulars. It was elicited from the plaintiff that in the busy season he earned as much as £3 a week after paying his rent and chemicals, and he had sustained the damage he now sued for. In cross-examination, he admitted his photographs were on glass, for which he charged sixpence each. He sometimes did not earn a shilling a day, but he had taken as many as 120 or 130 a day; all depended on excursionists and the weather. The learned Judge said that the contract not being stamped, the statute of frauds came into operation, as it was an agreement within the statute, and ruled in favour of the plaintiff, without costs.

KNOTT'S PATENT INJECTOR.—Mr. Knott, of Bolton, sends us a clever arrangement for making emulsion, or rather for adding the silver solution in small quantities to the gelatine during agitation of the mixture. It consists of two bottles, or, it you like to say so, of one bottle fitted with a large hollow stopper. The upper receptacle contains the silver solution, the lower the gelatine, and by vigorously shaking, the silver is made to descend drop by drop into the gelatine.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. PIPER AND CARTER, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. PIPER AND CARTER, *and crossed " Union Bank, Photographic News Account."*

EISTEDDFOD.—The address of Mr. Bull is 54, Great Queen Street, W.C.

F. I. G.—Your developer is all right. Do you carry the development far enough? The image should appear well detailed from the back of the plate; or toning would perhaps help you out of your difficulty, judging the tone through the plate. But most photographers get along very well without toning.

G. A.—You can employ bromide just as well with the oxalate developer as with pyrogallic.

J. NWORB.—Your hyposulphite solution is evidently exhausted after so much work; it is the worst kind of economy.

W. T.—The yellowness throughout the linen is due to imperfect fixation; you must not pass a hot iron over them, as the albumen in the fabric will brown and cake. Put in a little starch, and mangle them in a rolling press or lithographic press. Washing should do no harm, but rather good.

PHOTO-EXPERIMENTALIST.—Iodine will dissolve in an aqueous solution of iodide of potassium; otherwise you must use alcohol.

MELITAE.—There should be no precipitate at all. As your protosulphate of iron is hardly at fault, it must be your oxalate. You have possibly oxalate of ammonium instead of oxalate of potash; the former we know will dissolve the film. If you make use of neutral oxalate of potash, it is impossible to fail in mixing your developer. In our case, the very first plate developed clearly.

B.—We do not think the use of acetic acid in the washing water is of much benefit; hydrochloric acid will throw down your silver immediately.

ACID BATH.—Hydrochloric acid will throw down the silver from your washings; in the case of the toning bath and hyposulphite bath, if these are thrown together, employ liver of sulphur, which will precipitate the silver in the form of sulphide. In the former case the result will be chloride of silver. You can dispose of your silver in either form without difficulty.

A. B. C.—Hardwich's Photographic Chemistry is a most complete manual, but the question is if it is not too elaborate for you; Abney's "Instruction in Photography," and "Practical Portrait Photography," by W. Heighway, would probably suit you better. Write to our Publishers.

J. G. F.—Thank you; we should be glad to have what you proffer, particularly if brief and to the point, for our columns are much pressed.

A POOR PHOTOGRAPHER.—We shall be glad to see them. The surface may be due not only to spirit, but also to rapid drying.

PUZZLED.—Try washing with a little sugar water after toning. The yellowness *after* fixing and washing must be due to contamination with hyposulphite; this seems to us very plain, so you must take more care in washing, and also drying. Albumenized paper goes yellow very easily in summer, but recovers usually after fixing. We cannot recommend you a paper; try two or three samples from any respectable dealer.

L. L.—Baedecker's Guide is the best we can recommend you. If you are a German scholar, get it in that language.

C. WILLIAMS.—Not a painting, but an oleograph.

W. S.—You will find it in our impression of June 12th, 1874. Mr. Moock's bath, into which the plate is plunged, is there described as containing—

Water	1000 cub. cents.
Gallic acid	5 grammes
Gum	15 „

OSBERT.—The use of imperfectly cleaned plates is the most common cause; let us know if you are quite sure the evil does not lie here.

KRONE.—We have had no experience with the lens in question.

A. B.—Try Marion and Co., 23, Soho Square.

C. R.—The prints are good, considering the late hour at which they were taken.

E. HARRISON.—Refer to an army-list; that will tell you at once.

PATENTS.

Compiled specially for the PHOTOGRAPHIC NEWS, *by* Messrs. DES VŒUX *and* COLTON, *Patent, Trade Marks, and Photographic Copyright Office, 32, Southampton Buildings, Chancery Lane, London.*

No. 3353. WILLIAM FORD STANLEY, of Great Turnstile, Holborn, Middlesex, "Improvements in Photographic Cameras."—Dated 18th August, 1880.

No. 3355. FRANCIS HUGHES HALLETT, of St. Alban's Place, Saint James', Middlesex, "A New or Improved Process for Obtaining Coloured Photographic Pictures."—Dated 18th August, 1880.

The Photographic News, September 3, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Paget Prize Competition—Photography and Funerals—Photographing Old London.

The Paget Prize Competition.—The result of the competition for the Paget prize will be looked forward to with no little curiosity. It will be remembered that last year only two competitors sent in specimens, and the more successful of the two not fulfilling the conditions laid down, it was decided to keep the competition open until the first of this month (September). We are fain to think that the committee will have but little work to do. It is true that never before in the history of photography has so rapid an advance been made in dry-plate work as during the past twelve months, but since it is an advance on all sides, and not so much the result of any single discovery—save, indeed, that to Mr. Bennett is due the knowledge of the startling fact that dry plates could be made far exceeding in sensitiveness those by the wet process—it must be difficult to single out any particular formula of sufficient originality to demand a reward. One of the conditions of the award is, that "the description of each process accepted in competition shall contain sufficiently accurate details to enable any ordinarily skilful photographer to produce results thereby equal to those obtainable by the wet collodion process." Well, have not these conditions already been fulfilled without the stimulus of any prize, and does it not seem needless to offer a reward for that which is in existence and no novelty? The gelatine process has, indeed, passed from the stage of amateur competition into that of trade competition, in itself a sign of acknowledged success. In view of such an advance as this, the offering of a prize for the *best dry process*, which, according to our present knowledge, must be some modification of a gelatine plate, now seems to be a work of supererogation. Each maker of gelatine plates has his own method of working; but what inducement is a prize of £50 to him when, by entering the competition, he is compelled to disclose every detail, and possibly not succeed after all in gaining the prize? On the other hand, to be of real benefit, the exact formula must be stated, or the contest would degenerate into a mere competition between manufacturers, with the result that the defeated ones could, if they chose, challenge the award of the judges by means of advertisements. Such a competition is, of course, quite out of the question, but being so it reduces the competitors to amateurs. What then remains? Why, simply that if a prize be awarded at all, it must in all probability be taken by a third-rate process, though no doubt the best of the examples sent in, because, so far as at present appears, the professional manufacturers of gelatine plates have distanced the amateurs, who week by week are becoming more contented to purchase their plates ready made, and to abandon experiments on their own account. The truth is, since the Paget prize was first offered, the condition of things affecting dry plate work has altogether altered. There does not, indeed, seem the necessity for such a prize, and we should not be surprised to hear that not a single competitor had sent in specimens. Of course we do not deny that some one may discover a process which shall throw the present wonders effected by gelatine plates quite into the shade, but rumour as to such a possibility is silent. Unless this fortunate person may have sent in a claim during the last fortnight, we do not think this possibility has been realised, for up to quite recently, so we understand, no competitors had appeared.

Photography and Funerals.—Quite an innovation was introduced at the funeral of poor Miss Neilson—nothing less than the photographing of the ceremony of lowering the coffin into the grave. For this purpose staging was erected so as to secure a sufficient height to obtain a view of the coffin and its surroundings over the heads of the crowd, which was very large. Three pictures at different portions of the ceremonial were taken, three separate cameras, to save time, being used. A photograph of the casket (to use an Americanism) which contained the remains of the gifted actress before they were deposited in their resting place no doubt will prove a valuable memento to many, though the taste, to our thinking, is a morbid one. One would have thought that photography already pursued public characters sufficiently during their lifetime, without attending them to their grave. Whether the photograph in question was a commission or a speculation we are unable to say. Doubtless if the pictures are sold they will find plenty of customers, especially in America.

Photographing Old London.—As the Metropolis is so rapidly being metamorphosed, and its old landmarks mutilated or removed, there is more need than ever of the Society which was formed some twelve months ago or more for the purpose of photographing what is left of Old London. So far as we have been able to ascertain, the results of the operations of this Society have been meagre in the extreme. The *Athenæum* stated, some two months ago, that the Society had photographed, or were taking steps to photograph—we are not sure which—some half dozen "bits" of old London. But this seems to have been the only outcome. We trust that we are doing the Society an injustice, and that they have really been actively at work, but we fear such is not the case. With commercial gelatine plates, to be so readily obtained, there is no excuse for not displaying energy, and we hope some member of the Society will be able to inform us that something has been done. Cannot the Society be induced to exhibit their work on the walls of the forthcoming exhibition in Pall Mall?

FRENCH CORRESPONDENCE.

Precautions to be Taken in Working with Gelatino-Bromide—Means for Facilitating the Retouching Gelatine Negatives—The New Woodbury Process in France—Madlle. Marguerite Relvas at the Ghent Exhibition.

Difficulties met with in Working the Gelatino-bromide Process.—During a holiday tour which I have been making in the South of France, I have had many opportunities of conversing with a large number of photographers, both amateur and professional, on the subject of the gelatino-bromide process—the advantages which they find in working it, as well as the difficulties they have had to overcome in order to produce successful results, and more especially in order to obtain uniformity. Though I have encountered many who are fired with enthusiasm for the new process, I have also met with others who have been greatly discouraged by the precautions which are necessary to be taken, and which are much more numerous than in the other processes. Although these precautions are well-known, and have often been described, it may not be useless to refer to them, on account of the neglect of them leading to great waste of time and money, and still more because of the discouragement which is produced in the minds of beginners returning from their excursions with a lot of unsuccessful plates, and which tends to make them give up entirely the pursuit of photography. Perhaps the fiercest enemy we have to encounter is the light itself; its power of penetration is so great, and the plates are so highly sensitive, that the least infiltration of the luminous element through cracks in the dark slide, or defect in the general apparatus, gives rise to spots or fogging. It becomes, therefore, necessary to examine with the greatest care all the instruments and appliances used in operating. The interior of the dark slides and changing boxes, as well as of the cameras, must be stained a dull black. Brass fastenings and springs must also be blackened, for the least metallic reflexion, as has so often been experienced, will cause a spot. The groove in which slides the front of the dark slide must be lined with black velvet, otherwise we can never be certain that light will not penetrate there

and fog a portion of the plate. The smallest fissures, which we are too apt to disregard, become of the greatest importance, for no matter how slight they are, the neglect to stop them may cause us the loss of all our labour. What is more important than all the other precautions, is a thorough testing of the dark room. We ought to be perfectly certain of the non-actinic properties of the glass used for the window panes, or for the sides of the illuminating lantern; if this has not been attended to, chemically active light will enter and spoil all our plates. These glasses must therefore all be carefully tested. To do this, take a gelatine plate, half the surface of which is covered by an opaque screen, and expose it to the light passing through the window of the dark room, or the sides of the lantern which illuminates the dark room. When it has been exposed for a sufficiently long time, develop it, and if the part not covered by the screen has suffered the slightest change of tint, it is a sure indication that the dark-room is not properly proof against actinic light.

Retouching Gelatine Negatives.—Another objection raised against the successful working of the gelatino-bromide process is the difficulty of retouching. This objection has some foundation, but it is easy to overcome. M. Bouilland, a photographer at Macon, has sent me a letter on this subject, which I have published in the *Moniteur de la Photographie.* It seems to me that some light powder sprinkled over the negative while it is still wet will render the labour of the retoucher perfectly easy. For this purpose may be used a pumice box similar to that employed by engravers. I have also tried water holding in suspension a fine powder; the negative does not suffer, and the pencil will be found to bite well. Portrait photographers who use gelatine plates find it indispensable to have recourse to some means of facilitating retouching, and such a means, as it appears to me, there will be no difficulty in discovering.

Improved Woodbury Process carried out in France.—The house of Hutinet, so well known in photographic circles, has recently acquired the right of working the new photographic process of Mr. Woodbury, an account of which I have already given to the readers of the Photographic News. As I have more than once stated, the method which Mr. Woodbury has invented seems to me to be thoroughly adapted for producing the object he has in view. M. Lamy, the well-known manufacturer of carbon tissue, whose skill as a photographic operator has a world-wide renown, is charged with the practical working of the new process, while M. Hutinet, the head of the firm, confines himself to the commercial business. In this way the labour is well divided, and as the process is in every respect an excellent one, there can be no doubt of its meeting with successful results in France. From henceforth, photoglyptie, having got rid of the objections which were raised against it on its first introduction, will be within the reach of all photographers who desire to produce prints for commercial purposes. This will be a great gain in favour of the production of permanent prints, and is very hopeful for the future of photography in general.

An Amateur at the Exhibition of Ghent.—The number of amateur photographers has received a notable addition in the person of Madlle. Marguerite Relvas, daughter of my friend and able colleague, M. Carlos Relvas, of Gollega, in Portugal. M. Relvas has produced so much excellent work that he is able not only to repose on his laurels, but to hand down a part of them also to his daughter, whose first claim to wear them has been recently achieved at the International Exhibition of Ghent, where she exhibits seventeen choice works; these have been executed in various branches of our art, in collodion, gelatine, albumen, and carbon. This transmission of a taste for photography from father to daughter is, I think, worthy of all praise. M. Carlos Relvas has always shown himself a devoted and able, and I may with truth add a generous, adherent of our art; I cannot but wish all success for his daughter.

Leon Vidal.

At Home.

DR. HERMANN VOGEL AND HIS NEW EMULSION.

The sombre light of a dark room, especially in these days of ruby windows, is not well fitted for purposes of introduction. There are five of us here at rather close quarters, and at first it is difficult to recognise one another. Those bright laughing eyes before the developing table belong to Dr. Vogel, we are sure, and a taller figure at his elbow we find to be Mr. Orme, F.C.S., the chemical lecturer at the University College School. A bigger form still, we now see moving about in the gloom, is Mr. H. P. Robinson, while a fourth occupant of the dark room is Mr. Mayland, of Regent Street. Dr. Vogel, here in his temporary "home," has not yet begun his demonstration, so we are just in time; and presently, as our eyes get more accustomed to the darkness, we see a jug of warm water at his elbow, and half a dozen clean plates convenient to hand.

"Here is my emulsion," says Dr. Vogel, unpacking a small bottle; "it is set at present, and I must put the bottle into warm water for a few minutes to render it limpid." Meanwhile the preparation of the plates is proceeded with. Dr. Vogel prefers above everything a substratum of gelatine to work with, not only for his own emulsion, but for collodion work as well, preferring the same to albumen. An albumen substratum sometimes begets spots and patches; not so gelatine, especially when mixed with chrome alum. The doctor recommends:—

Gelatine	1 part
Water	300 parts
Chrome alum solution	6 ,,

The chrome alum solution is prepared by dissolving one part of alum in fifty parts of water.

But we cannot wait just now for the application and drying of a substratum of this kind, so Dr. Vogel takes another one, viz., rubber dissolved in benzole. Exception might possibly be taken to the use of a film of rubber in this way on a plate, by reason of its oxidation in time; but as the whole surface is covered by the emulsion, this possibility is scarcely worth discussing. The plates are coated and put on one side.

By this time the emulsion is perfectly fluid, and Dr. Vogel takes the stopper out of the bottle. There is no smell of ether, and the doctor tells us it is not present; there is no need, however, to inform us of the presence of acetic acid, for its sour odour is at once apparent. Our chemist has an idea that as there is no ether, there is probably no alcohol, the dissolution of the pyroxyline contained in the emulsion being brought about with acetic acid equally with the gelatine; for there is, be it known, one class of guncotton that readily dissolves in acetic acid. But with this we have little to do. A little acetic acid is called for to moisten a rag, wherewith to cleanse the mouth of the bottle—acetic acid thus being obviously the main solvent employed in the emulsion—and now the coating of the plates begins.

The emulsion in the Doctor's hands pours very smoothly and in a limpid stream, the surface of the glass being covered as easily as with collodion. It looks like thin milk, and, after application, the plate is at once tilted to drain at the corner like a collodion plate; but the emulsion does not set so quickly, and the film is drained and drained again until the last drop has been caught in the waste bottle, to be employed once more after filtering. The plate is scarcely a moment in a horizontal position. To cover a 9½ by 4½ inch plate, a treble carte de-visite, takes four cubic centimetres of solution, costing twopence halfpenny, Dr. Vogel informs us.

The emulsion may be used while wet, but it is not so sensitive in that condition, and it is a *sine quâ non* that gelatine-covered plates be employed. For this reason the experiment was not made, but the plates, as soon as coated, were stood on end in a box to dry. Dr. Vogel, to get the

best results, requires not only that his plates are dry, but that they are dried within an hour, and to this cause did he attribute the comparative insensitiveness of the first plate under trial.

A No. 2 B lens (Dallmeyer's) was employed, furnished with No. 2 stop, the curtains of the studio being drawn in part, to subdue the light considerably. Under these circumstances a Nelson plate, developed with Nelson's energetic sugar developer, gave two well-exposed portraits in two and three seconds; the Vogel emulsion was exposed for two, four, and six seconds.

Dr. Vogel developed with two solutions:—

A—Bromide of potassium	1 part
Water	10 parts
B.—Pyrogallic acid	1 part
Alcohol	10 parts

Two cubic centimetres of the bromide solution, and two and a half of the pyrogallic solution, were mixed with three ounces of water, and poured upon the plate; as soon as the image began to appear there were added four drops of ammonia mixed with two ounces of water, and subsequently a further similar quantity.

The development was certainly slow, a result, as we have said, that Dr. Vogel ascribed to the plate being insufficiently dry, and the fixing in the hyposulphite bath was acccomplished in some two or three minutes.

Taken into the glass room, the film was critically examined. "Good!" said Mr. Robinsion; "good, so far; but we must have more density than that." To this Dr. Vogel assented; "I shall show you that you can intensify with pyrogallic and silver as easily as in the wet process. But please first to look at the film where it is drying already at one of the corners." And sure enough, the film, like one of collodion, already began to show signs of desiccation.

In one other respect the film was like collodion; it was of a clear grey colour, without any of that brownish tinge inherent to all gelatine plates developed with pyrogallic acid. But there was no denying that the emulsion was slow, for that portion of the plate which had received six seconds' exposure was the only part thoroughly exposed.

After Dr. Vogel had shown clearly enough that there was no difficulty about treating the image with pyrogallic and silver to render it more intense, a second plate was taken in hand. This was drier and gave better results, showing a sensitiveness about equal to half that of a Nelson plate; an epoxsure of two, four, and five seconds, resulting in giving two good portraits, where the plate had been exposed for the longer intervals.

The intensifier Dr. Vogel employed to give extra density to his pictures is of a simple nature.

A.—Pyrogallic acid	1 part
Water	2 parts
B.—Nitrate of silver	1 part
Water	50 parts
Citric acid	1 part

These are used in equal parts, a little citric acid and water being employed in the first place, to remove the last traces of hyposulphite of soda from the fixed image.

Mr. Robinson took the next plate in hand. Without hesitation he exposed the plate in three portions, for three, four, and five seconds, and then, with characteristic celerity, proceeded with its development. Deftly he poured out his own developing solutions, made up according to Nelson's formula, and adding a little more bromide, with a swift turn of the wrist bathed the plate with the solution. What would be the result, we wondered, of such rashness. It was only at the worthy doctor's earnest exhortation that the extra bromide was added, otherwise Mr. Robinson refused to listen to reason. The little black tray was rocked to and fro, and all eyes were fixed upon the mad attempt. But we doubt only for a moment; for three images, bright and clear, suddenly leap into view, and Dr. Vogel, standing by, throws up his hands with delight. His plate, in Mr. Robinson's hands, is shown to be more sensitive than in his own, the sugar developer and Mr. Robinson's masterly manipulation having effected the alteration. In these latter circumstances, the sensitiveness of Dr. Vogel's emulsion certainly compared with that of Nelson's plates as the figures 2 to 3.

It is, however, fair to say that none of the plates employed were quickly dried, neither were they dried completely; nor was the gelatine substratum employed, which Dr. Vogel advocates as the best of its kind. Indeed, it is not likely, as our readers know very well, that an evil-smelling and injurious liquid like the benzol solution would ever be looked on with favour in photographic laboratories.

The advantages claimed by Dr. Vogel are numerous and important, and, so far as we have been able to judge, we think he will be able to make most of them good. In the first place, the plate may be drained immediately after coating, which is already a great thing. The necessity for a levelling stand is removed, and the photographer can choose his own glass and prepare his own plates. After he has prepared them, too, the films will keep good for any length of time. He must, however, be provided with a drying box or closet if he desires to work quickly, otherwise the film will not dry rapidly enough, and he must allow at least an hour's interval if he wishes the best results. The smell of acetic acid, though, perhaps, unpleasant to some people, can scarcely be made subject for complaint in the case of the new emulsion, and is not likely to prove injurious to health. Finally, there is the possibility of intensifying the film with silver, and the ability of the negative to dry within half-an-hour of its being washed, two important advantages which it is difficult to overrate. We may add, too, that the surface of the negative is of a matt nature, and permits of being retouched with wonderful ease. So far as we can judge, by our limited experience, the emulsion will not drive gelatine plates from the field; but, nevertheless, it appears to be too valuable a power that photographers can afford to be without its aid.

Dr. Vogel has since sent us the formula he now employs with the best success; since the sugar developer in Mr. Robinson's hands has shown him how much the exposure of his plates may be shortened, he says he shall continue to employ it "for ever."

Solution 1.

Pyrogallic acid	2 drachms
Alcohol (methyl.)	14 ,,
Water	6 ,,
White sugar	3 ,,

Solution 2.

Liquor ammonia	8 drachms
Water	2 ,,
Bromide of ammonia ...	...100 grains
White sugar	... 1½ drachm

Mix 1 drachm of No. 1 with ½ drachm of No. 2, and 3 ounces of water.

The next "At Home" will be "Messrs. Russell and Sons, at Worthing."

A FORTNIGHT IN SWITZERLAND WITH THE CAMERA.

BY W. H. PLAISTER, F.R.G.S., M.R.C.S.

SOME remarks on a tour in Switzerland, from which I have just returned, may prove of interest to such of your readers who may contemplate taking their camera with them on their summer outing, that I am induced to ask you to publish a few details.

My destination was Chamounix, and my great desire was to take some views of that monarch of mountains—Mont Blanc. After crossing to Dieppe, I had a little difficulty

with the Custom House officers, who would not be appeased till they saw what I had in a suspicious-looking cigar box. I explained, however, that they were dry plates; and they passed them through in such a manner as to prove that one might have much more difficulty in getting them through a French Custom House than through a Swiss, which gave me no trouble whatever. As an amateur, I usually make my own plates; but this weather completely beats me, so I got four dozen from Wratten and Wainwright, and packed them up in packets of six, wrapped them up in lead foil, and stored them away in the said cigar box, which was to do duty for my lantern. Now, I advise all amateurs to do as I did, that is, to develop one or two plates at the end of every day's work, just to see if the exposure be right, for it must be remembered that there is much more actinism in the light on the Continent than here. If this be not done, much disappointment may be occasioned on the return. No trouble need be experienced; all that is required is a developing tray, a small quantity of alcoholic solution of pyrogallic, and a few drachms of bromide solution. No hyposulphite need be taken, for this would require the use of more water; that can easily be obtained in a bedroom of a Continental hotel; and if the developed plate be washed (I usually soak for a few minutes in water), and kept in the dark, no harm will come, and fixing can be done on the return, when, if frilling should take place, better means can be taken to combat it. The box in which the plates were packed was my lantern, which acted exceedingly well by cutting out a hole in one end, boring a few air-holes at the bottom, turning the box up on end, sticking a piece of candle in it, and pinning some orange paper over the front, as I hate baggage. I took the smallest of my cameras, a small single lens, stereo, well stopped down, so that I could enlarge my pictures on my return; but I found that there really is no trouble with the apparatus, whatever size it may be, for guides are always at hand to carry it, and, moreover, they can point out localities where one can obtain better views.

On arriving at Geneva, my first ascent was to the fourth storey of the Grand Hotel de Russie, and from my room, which commanded a fine view of the Lake, I took my first picture, by way of test. I hit the right exposure, and got a good view.

At Chamounix I was most fortunate in getting clear weather, the summit of Mont Blanc, with its neighbouring ice peaks, being in view the whole week of my stay. I got, consequently, good photographs, but I found my chief difficulty lay in getting a good contrast between sky and snow. The guide is a wonderful institution; he carries all the baggage, and it is impossible for the photographer to do without him. He delights to take one over the most impassable passes, and the more the path bears resemblance to the Dome of St. Paul's, whether over ice or rock, the better pleased he seems to be; and I am inclined to the belief of the late Albert Smith, that a guide or a mule will go anywhere, except up the walls of a house.

Now I crawled up a good many mountains, but, perhaps, the toughest bit was up a mountain path over the glacier of Bosson, to a point between the Piese Pointue and the Grands Mulets. where I had promised to meet some friends with their guides on their descent from Mont Blanc, and take a photograph of the group. Well, the guide and myself—he with the camera, &c., I with my Alpenstock—clambered up, up, up; always seeming to be getting to something, yet never getting there. Now over a glacier, now round a precipice, till at last we did get to a resting place, and then I was told we were just half-way! But perseverance conquers everything, and at length, after hours of toil, we managed to get to the place indicated by the guide as the spot our friends would have to pass on their descent. I got a tolerable view of the group, with their ice axes, ropes, and ladders. It is very picturesque; but more justice would have been done if the camera had been in the hands of Mr. England—so, indeed, I thought on looking at some of his photographs at the hotel on my return. What a number of friends one finds during these excursions, and how they like to be taken when crossing glaciers, or cautiously creeping down dangerous passes, and how they would like to have a photograph of themselves, just to show their friends when they get home! It is a pity I could not take more views, and all for want of a changing box. Some have been unique in their way. For example, I should like to have shown my friends, on my return, how a two-horse vehicle passed our own in going over the Tête Noire Pass. I can say, without fear of contradiction, that there were not more than four inches between the wheel of the passing carriage and the edge of an unguarded precipice one thousand feet in depth. A row of mules, too, with their riders, in coming down perpendicular passes, keeping as near as possible to the edge, especially when they meet and neither will give way, would have made a pretty picture. But I must not grumble, as I got some tolerably good views, and I can strongly recommend Switzerland as a happy place to spend a fortnight.

AN ACCOUNT OF EXPERIMENTS IN PHOTO-ELECTRICITY.

BY GEORGE M. MINCHIN, M.A.,

*Professor of Applied Mathematics in the Royal Indian Engineering College, Cooper's Hill.**

1. *Two Objects of Photo-Electricity.*—In the study of the electric currents produced in various ways, by the action of light, I have had two objects in view, viz.:—

(I.) The production at a distance of effects due, in the first instance, to the photographic action of light; and

(II.) The continuous daily registration of the intensity of sunlight of any selected wave-length.

It is at the outset evident that for the solution of the latter problem, the action of the light whose intensity is to be measured and registered must be received on some substance whose chemical composition is either unaltered by the light, or so slowly and slightly altered during the period of observation that the magnitude of the change may be neglected.

For the solution of the former problem it occurred to me, in the first instance, to receive the photographic action on plates coated with the silver salts in ordinary use among photographers; but I do not now think that it would be necessary to work exclusively with these substances, and if the use of them can be to any extent dispensed with, a corresponding gain would apparently result, since they are permanently and very rapidly decomposed by luminous action.

2. *Luminous Action a Source of Electricity.*—It has been long known, from the experiments of Becquerel and Grove, that electrical currents can be produced by the action of light. Becquerel took two clean silver plates, exposed one to the vapour of iodine, plunged both into a cell containing a feebly conducting liquid, and completed the circuit through a galvanometer. The cell being completely covered up, the moment the circuit was completed, a strong current was set up. This current disappeared after about twenty-four hours. Then, on illuminating the sensitized plate, an intense current was generated by the light.

Grove used a prepared Daguerreotype plate enclosed in a box filled with water, having a glass front with a shutter over it. Between this glass and the plate was placed a gridiron of silver wire, and, on completing the circuit through a galvanometer, a current was generated by the action of light on the Daguerreotype plate. (See the *Correlation of Physical Forces.*)

Grove also found that when two clean platinum plates were immersed in a cell containing acidulated water, and one of them was exposed to light, a current was produced. Before the light was allowed to fall on the plate there was, of course, the current which is always produced by the immersion of two plates, however similar we may succeed in making them, in any liquid. This current I shall in the sequel speak of as "the disturbing current," since it is produced by some other agency than that of light; and I shall frequently refer to it as the "D. C.," for shortness. The current produced by the action of light on one

* Brought before the British Association.

of the platinum plates was found by Grove to be always in the same direction as that of the D. C.; and he found, moreover, that the current produced by blue rays was greater than that produced by red.

Currents of this latter kind may be produced by the agency of light in several different ways. For instance, the two platinum plates will give the current in question if they are immersed in common tap water. Again, the two clean platinum plates may be replaced by two clean silver plates, and we shall obtain still stronger currents by the action of light on one of them. No doubt several other metals would be found to give similar results.

All such currents—viz., those generated by the action of light on any unsensitized metallic plate immersed in a liquid, in presence of a similar plate unexposed to the light—I shall in the sequel designate as "Grove's currents." They are exceedingly small compared with the photo-electric currents with which we shall be occupied.

3. *Plates Employed.*—Since the substances to be acted upon by light were, in my first experiment, salts of silver, I chose silver plates in order to avoid as much irrelevant action in the cells as possible. At first the plates were simply stiff pieces of silver foil, about two or three inches long and one or two inches broad; but it appeared at least possible that much of the current was lost by passing from the coated (or sensitized) side of a plate round to the back of the same plate; and for this reason, after having already performed several experiments, I tried the effect of insulating the back and edges of the plate by a thick layer of shellac varnish. The result was a greatly improved action, and this finally led me to fix the silver foil by means of pitch to rectangular pieces of glass. Thus the back of the plate was completely insulated. For the purpose of making the connections, a piece of thin silver wire, about two inches long, may be welded to the upper edge of each strip of silver foil before it is fixed to the glass plate; but binding screws will do, if care is taken to keep the portion of the silver plate which they touch from contact with the liquid in the cell.

Fig. A shows the arrangement of the two plates in the cell. The plate coated with the silver salt, or other substance to be exposed to light, is S. It stands in a rectangular glass cell, in

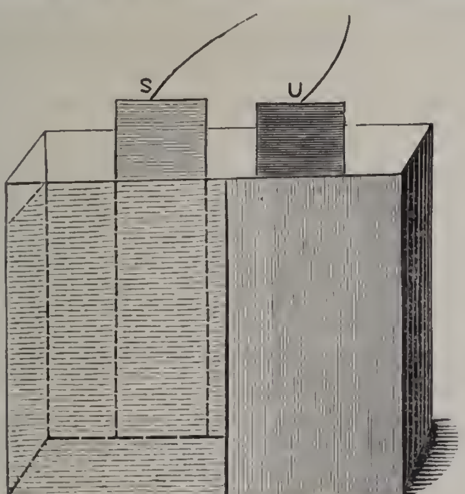


Fig. A.

contact with one of its faces: slightly to the side of S, and in contact with the opposite face of the cell, stands the unsensitized plate, U. In the figure we are looking at the back of U; and the whole of the cell, with the exception of the portion directly in front of the sensitized plate, ought to be covered with black paper, to prevent the access of light to the unsensitized plate.

4. *Notation Employed.*—We shall have such frequent occasion to refer to the sensitized and unsensitized plates—meaning, respectively, the plate coated with the substance to be exposed to light, and the plate uncoated—that we shall, for shortness denote them by the letters S and U. As already stated, any current produced by agency other than that of light will be denoted by D. C.

5. *Disturbing Current.*—It may be well to state at once that the D. C. varies, both as to duration and to direction, in an irregular manner, and that Grove's observation, to the effect that its direction is always the same as that of the current generated by light in his experiments, is not true with regard to photo-electric currents generated in other ways.

6. *Chloride and Bromide of Silver.*—If an emulsion is formed by shaking up in a test-tube a little finely-powdered chloride of silver mixed with collodion (the test-tube being, of course, completely screened from light by a covering of black paper), a silver plate coated with it in the dark, immersed in presence of an uncoated plate in a cell containing distilled water and a few grains of common salt, will, when exposed to light, give rise to a current, the direction of which is

from U to S in the cell.

If the liquid employed is dilute H_2SO_4, the same result follows, and apparently the current is of the same magnitude.

Sunlight (dull) is quite sufficient to give the current, and the deflection of the spot on the scale will be observed to rise or fall according as the intensity of the incident light increases or diminishes.

I have also tried the experiment by using the light of a candle placed at different distances from the cell, and each distance of the candle produced a corresponding deflection of the spot.

The effects of light of different colours were studied by interposing coloured glasses in the path of the incident light, and it was found that, while the effects of blue and violet rays were very great, the red rays gave a hardly appreciable effect. Light falling on the plate after having passed through a thick cell containing a dense solution of ammonia-sulphate of copper gave also a large deflection. The galvanometer used was a Thomson reflecting galvanometer, of about 7,000 units resistance; the screen was usually placed at a distance of about a yard from the mirror; and a piece of burning magnesium ribbon, held at a distance of a foot from the plate, would cause a very rapid motion of the spot off the screen.

The plate may be coated with an emulsion of bromide of silver made in the same way, but I have preferred to use the well-known "Liverpool Emulsion." In this case the liquid in the cell was usually distilled water, with a few grains of bromide of potassium.

The current appears to be of about the same strength as in the case of the chloride cell, and the direction is still from U to S in the cell.

It is scarcely necessary to say that chloride and bromide plates must be prepared in a photographic dark room.

I have not systematically kept a note of the direction of the D. C. with these plates, but I have noted some instances at least in which it is opposite to that of the photo-electric current.

7. *Iodide of Silver.*—Let a silver plate be coated, in the usual way, with silver iodide, by first pouring a layer of iodized collodion over the plate, and then immersing the latter in a nitrate of silver bath. If the liquid in the cell is distilled water, with a few grains of iodide of potassium, it will be found that the direction of the photo-electric current is,

from S to U in the cell,

that is, opposite to the direction of the chloride and bromide currents.

9. *Nitrate of Silver.*—A solution of silver nitrate was mixed in a test-tube with rather thin gelatine, and a silver plate coated with the mixture was immersed, in presence of an uncoated plate, in a cell containing distilled water and a few grains of nitrate of barium. D. C. from U to S in cell, rather strong, and of very long duration. Light falling on the plate gave a comparatively small result.

The plate was then further washed over with the silver nitrate solution, and there was an improved result. The cell was connected up with the galvanometer all night; and next day, the spot having come to rest at 250 divisions of the scale from the zero (which was its position when no current passed), magnesium light was used with great effect.

When no glass was interposed, the spot moved a long way off the screen in the direction opposed to that of the D. C. With an interposed blue glass the current appeared to be nearly as strong as when no glass intervened. An interposed red glass gave a very small current, indicated by a motion of only ten divisions in the opposite direction. From such a small motion, however, no conclusion can be safely drawn, for the current may be only a Grove's current.

Professor Minchin further described the "Photographic Effect of Current," "The Action of Light on Current," and other interesting phrases of his subject.

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HYDROQUINONE.

The interesting article on "A New Developer," by Captain Abney, and Dr. Eder's experiments in the same direction, may render a few remarks on the active substance, hydrokinone, not unacceptable to our readers.

Hydrokinone (or hydroquinone, as it is usually called in English) is in its chemical composition a dioxybenzol. Carbolic acid, hydroquinone, and pyrogallic acid are all chemically related to each other, and have benzol as a common ancestor. Their composition is expressed as under:—

$C_6 H_6$ Benzol.
$C_6 H_6 O$ Oxybenzol (carbolic acid).
$C_6 H_6 O_2$ Dioxybenzol (hydroquinone, resorcin, and pyrocatechin).
$C_6 H_6 O_3$ Trioxybenzol (pyrogallic acid).

With the majority of this family photographers are already well acquainted. Benzol is frequently employed in printing room and laboratory for coating plates, whether for camera or carbon work, while carbolic acid, the well-known antiseptic, is often made use of in colloid mixtures to prevent their decomposition. Then comes hydroquinone, the body we are now discussing; and, finally, pyrogallic acid, the photographer's staunch and intimate friend.

The chemical stability of benzol renders it unsuitable for the work of reduction. By oxidising—or, more correctly, hydroxylising—our benzol, we lessen this stability, and obtain products solublein water. Carbolic acid itself, in weak ammoniacal solution, might perhaps act as a very slow developer; but the reduction effected by the hydroquinone will probably be precise as a correlative of the simplicity and definiteness of the oxidisation of the hydroquinone.

It will be seen that in pyrogallic acid the oxidation is pushed a stage farther than in hydroquinone. Hydroquinone, while reducing the silver compound, is itself probably oxidised to quinone, $C_6 H_4 O_2$; pyrogallic acid, on the other hand—a somewhat over-weighted and unstable structure—probably falls into completer ruin.

Whether Capt. Abney's suggestion will ever become a new process will much depend on finding another source of hydroquinone, so as to reduce its present price to about one-fourth. As Dr. Eder has shown, it has, in some respects, advantages over pyrogallic acid as a developer of gelatine plates; but these advantages, marked as they may be, are at present lessened by the high price of the newer compound.

We have figured above the relationship of pyrogallic acid and hydroquinone to benzol, but while for our pyrogallic acid we are wholly indebted to the vegetable kingdom, hydroquinone is most neatly and directed prepared from quinic acid, a somewhat scarce and costly vegetable acid.

Methods, it is true, exist for the preparation of hydroquinone from carbolic acid or aniline, but they are not very productive. Still, if hydroquinone is wanted, chemists will probably supply us with a cheap means of making it from benzol. Resorcin—a substance closely allied to hydroquinone—was ten years ago a chemical curiosity. A few years since, a very pretty dye, eosin, was made from it, and now it is manufactured cheaply from benzol and sulphuric acid, and can be bought for three or four shillings an ounce; and from the same materials, benzol and sulphuric acid, quinone and hydroquinone will probably be procurable.

En attendant, those of our friends who wish to find a milder developer than pyrogallic acid might try resorcin, which is not much dearer than pyrogallic acid, and is already a commercial article.

Finally, the solubility of this series of bodies is well worth remarking upon. The first, benzol, may be said to be insoluble in water; the last, pyrogallic acid, is so freely soluble that one part readily dissolves in from two to three parts of water. In other words, a pound of pyrogallic acid will all dissolve in two to three pounds of water. Carbolic acid is more soluble than benzol, and in resorcin and hydroquinone the power of solubility has increased to a marked degree, although it is not so high as in the case of pyrogallic acid. So that the degree of solubility plainly increases in these substances with the degree of oxidation.

ON THE EMPLOYMENT OF CHLORIDE IN THE WET COLLODION PROCESS.

If collodion is mixed with chloride alone, and a plate sensitised and exposed in the ordinary wet process, we get, on development with acid pyrogallic or ferro-sulphate solution, a clear enough image; but the film, as most of our readers are aware, is much less sensitive than one containing iodide of silver or iodo-bromide of silver, or even than a wet plate containing pure bromide of silver treated with an acid developer.

For instance, a pure chloride of silver plate requires twice or three times the exposure of an ordinary wet iodo-bromide film. Moreover, a chloride of silver film when it comes out of the dipping bath is always much thinner than a collodion plate in which iodo-bromide is contained.

As a supplement to iodised collodion, chloride is, however, instrumental in producing an effect of a most desirable character. The chlorides which may be designated as most favourable for use in this connection are those of cadmium, calcium, and ammonium. Each and all of these can be employed with advantage, the chloride, when added to an iodised collodion, acting very much in the same way as an addition of bromide. According to Dr. Vogel, indeed, who is a well-known authority on these matters, chloro-iodized collodion gives more detail in the shadows and clearer outlines than bromo-iodized collodion; the latter, however, works softer and is more sensitive.

When we add chloride to an iodo-bromized collodion, the effect of the chloride is much less remarkable, a circumstance no doubt attributable to the fact that bromide and chloride exert pretty well the same action; but even here we have found the addition of chloride to still further enhance the clearness of the image.

Chloride of calcium, it is well-known, imparts to the negative a clearer and whiter character when added to iodized or iodo-bromised collodion, and for this reason it was that in the early days of direct glass positives the addition of chloride was frequently resorted to. Only care must be taken not to add too much of the salt, for in this case the pictures assume something of a yellow or greyish tint. From the fact that iodo-chlorized collodion yields negatives with very pure whites and deep blacks, and imparts to them a hard glassy look, collodion so treated is well adapted to the reproduction of engravings, woodcuts, &c.

Now-a-days the employment of iodo-chlorized collodion

in the wet process is well nigh forgotten. But the other day, in a description of the Military Geographic Institute of Vienna, we noticed, among other methods in use at the establishment, this one in particular, which is employed, it seems, in the photographic laboratory of this model establishment for reproducing linear drawings.

Austria, as we have on several occasions remarked, dispenses altogether with hand-engraving in the production of its ordnance maps. The maps are sketched by hand in indian ink upon drawing paper, and then photo-lithographed. It is in the photographic operation where the iodo-chlorized collodion to which we refer is made use of. The iodizing solution for admixture with the normal collodion is thus compounded :—

Chloride of calcium	1·6 gramme
Iodide of cadmium	7·8 ,,
Iodide of ammonium	4·7 ,,

Dissolved in 100 cubic centimetres of absolute alcohol. The collodion is made up of :—

Ether	500 cub. cents.
Absolute alcohol	400 ,,
Pyroxyline	16 grammes

The plates are sensitized in an ordinary nitrate of silver bath of 10 per cent. strength, and their development brought about by solutions made up according to the undermentioned formulæ :—

A.

Protosulphate of iron	35 grammes
Acetic acid	70 ,,
Water	300 cub. cents.

B.

Nitrate of lead...	22 grammes
Water	350 ,,

These solutions A and B are simply mixed and filtered ; or in their stead, an ordinary three per cent. ferro-sulphate developer may be employed, to which half as much sulphate of copper is added as the solution contains iron. These plates give clear and delicate negatives, we are told, with very little difficulty, leaving the finest lines clear and free from fog.

We hardly know who was the first to suggest the addition of chloride to iodized collodion, but one of the earliest references to the subject may be found in Monckhoven's "Traité Général de Photographie" of 1856. Monckhoven there suggests the addition of one-tenth per cent. of chloride of cadmuim to iodo-bromized collodion for the purpose of giving the negatives more vigour. About the same time, too, Maxwell Lyte seems to have proposed the addition of sal-ammoniac. Bertrand and Hockin following in 1862 with the same suggestion. We see, too, that Hermann Krone, whom our readers may remember as the President of the Dresden Photographic Society, employed chloride of zinc in 1856. To contribute further to the history of this subject, we may mention that Heisch in 1863, and Van de Beeck in 1864, advocated the use of iodide of ammonium together with one-tenth of its weight of chloride of calcium, as a suitable sensitizer for collodion which was to serve for reproductions. More recently, as we know, Jabez Hughes in 1868 recommended the sensitizing of portrait collodion with iodide of ammonium together with quarter the latter's weight of chloride of cadmium. Waitz and Black in 1869 also used an iodo-chlorized collodion in portrait photography.

We quote these examples simply to show that iodo-chlorized collodion has for a long time past had many friends, and the experience of some years proves that these have been well merited. Its employment may in fact be recommended in all cases where fine, clear, and vigorous negatives are desired, and where clearness and intensity rather than harmony and gradation are in request. But for negatives in which delicacy, half-tone, and harmony are the main points to be observed, we cannot of course do better than employ iodo-bromized collodion in wet plate photography.

Notes.

"There is no such thing as pure water in nature," was the startling announcement made by the President of the British Association in the course of his inaugural address. "There is salt in all rock beds, and salt everywhere ; no spring water can be found perfectly free from chloride." These are home truths that photographers should take to heart.

By the way, the meeting of the Association this year at Swansea was much smaller than usual, and the practice of announcing the number of members in attendance, &c., was for this reason abandoned. For some years past interest in the Association has been on the wane, and as the attractions this time were rather below the mark, it is not surprising to find a falling-off in the success of the meeting.

On the subject of the reversion of the photographic image, Mr. Robert Hunt, F.R.S., writes us from St. Ives, Cornwall :—"If you refer to Sir J. Herschel's *second* paper (in the Transactions of the Royal Society) on the Photographic Image, about 1842, you will find the indications now published as something new. Away from all my books and papers I cannot at once refer to my observations on the 'reversion,' so-called, of the photographic image, but in the *Phil. Mag.*, about 1842, you will find a paper of mine on the use of hydriodic salts as photographic agents.'

Mr. Hunt adds :—"I know that I often obtained these reversions, and I feel pretty sure I described them in that paper. Also in my paper in the Philosophical Transactions on Daguerreotypes on Paper, published about 1843 or 1844 I must have mentioned the change, since I frequently exposed the darkened chloride of silver papers until the silver was revived, and then they received the mercurial vapour in the same way as silver plates."

In Mr. Howard Vincent's interesting report on the Criminal Investigation Department for the past year, he refers to the fact that "photography and engraving are now extensively employed in the pursuit of offenders, and the endeavour to trace stolen property" ; and he mentions one particular case in which "every constable and many other public officers in the northern counties and south of Scotland were supplied with the portrait and facsimile of the handwriting of an individual whose apprehension was sought, and his speedy arrest followed."

Gelatine plate workers should always bear in mind that in perchloride of iron they have in their hands a power that may be exercised to wonderful advantage in the reduction of dense negatives. Very high lights and solarised patches may be treated successfully by manipulating the perchloride solution with a brush, not a trace of dodging remaining behind if the operation is performed with care. We have seen several fine negatives of late in which detail in the high lights have been laid bare by simply reducing patches of opaque film in this way.

Photographers will regret to learn there is little probability that the introducer of bichromates into photography, the late Mungo Ponton, has left any notes behind him touching this important subject. Mrs. Ponton writes: "It is several years since my husband ceased working, and his notations generally are in a shorthand peculiar to himself."

A collection of photographic carriages would make a curious exhibition. The neatest thing of the sort we have seen is that of Mr. Jabez Hughes, of Ryde. It is a covered wagonette of smart black leather, hung on light springs. A single horse is sufficient to take it along at a trot, and altogether the affair makes a trim turn-out. The yellow window looks out on the driver's back; the casement, however, is pretty large, and when open it is pleasant travelling enough for the passenger or two inside.

But the model photographic wagon is that belonging to the Royal Engineer equipment. No British army corps is now complete without its photographic wagon, a square-looking, compact vehicle, drawn by a pair of horses, one of which is ridden postilion-fashion by a mounted Sapper. It is sufficiently light to be taken along a road at good speed, and yet strong enough to bear jolting over a ploughed field. It is at once a complete laboratory and dark room, and also a smart travelling office, according as the lighting of the windows is modified.

As the duties of military photographers in the field are of a most varied nature, the wagon has to fulfil many objects. It must afford a dark room for ordinary manipulations, be capable of employment as a photo-lithographic establishment, and since the electric light is henceforth to be used for copying plans and maps in the absence of daylight, must be replete with facilities to further work of this kind. In a word, the photographer in the army has now duties to fulfil as responsible and important almost as those of the surveyor, telegrapher, and signaller.

But the most curious photographic carriage of all is that employed at the Royal Arsenal at Woolwich. It is a long, ugly caravan on four wheels, painted Government grey, and requiring also a pair of horses for its conveyance from place to place. Although defective in ventilation, it has one important photographic quality—it is very dark inside.

But it was not made dark especially for the photographer. The conveyance was originally built for carrying convicts located in the hulks off Woolwich to their work in the Plumstead Marshes and distant parts of the Arsenal. Like the prison van of to-day, it afforded its passengers no out-look, and obviously required little alteration to turn it into a movable dungeon, wherein photographers might expiate their sins.

"Put a lump of alum in your developer," was the practical advice of a practical man the other day to one who complained of frilling. Sometimes the gelatine film will not remain intact during a long course of development in hot weather, and this simple remedy is therefore worth noting just now. It retards development a little, but that is all.

The first application of small or incandescent electric lamps to the lighting of a ship's state room and saloon is reported, the mail steamer *Columbia* having been fitted with these appliances on the Edison system. As our readers are aware, Mr. Swan, of Newcastle, has for some time past employed incandescent electric lamps for room illumination, to the success of which we were able to testify.

We heard it stated the other day—with how much truth we do not know—that a permit is necessary for any photographer to enter our London Parks with his apparatus. Can this be? Mark Twain wondered much at our fine parks, but more still at their inscrutable regulations. It was glorious to think, he said, that every one, from the highest to the lowest, could enjoy the delightful freshness of these spacious areas; only, while the occupants of carriages could drive freely through the green, airy thoroughfares, those in cabs and carts were required to sniff at the breeze through the iron railings.

Topics of the Day.

PORCELAIN PHOTOGRAPHY AS A DECORATIVE ART.

BY J. R. SAWYER.

In the very heart of Old England, in the midst of her most lovely charms, upon ground of historic interest, from the time of the Romans downwards, in the near neighbourhood of places whose names recall the most stirring events of English history, rises a grand chain of hills, dividing Worcestershire from Herefordshire; on the south, the Herefordshire Beacon, crowned with the boldly drawn lines of the ancient British camp of Caractacus, dominates the vast and fertile plain extending for miles and miles into the far distance; on the north, the Worcestershire Beacon rises high above the beauties of Great Malvern, which nestles at its feet, or aspires to climb its bold flanks.

Oh! for the old days. "Oh! for the time twixt now and then," when with youth, health, and strength, we breasted those hills, laughed to scorn those zigzags, up which then, as now, quiet people leisurely ascended on the backs of equally leisurely donkeys, little thinking, or, if thinking, caring nothing, as to the days when we, too, should bless the convenient and admirable paths by which the wise ones of Great Malvern have contrived to tempt their visitors to the top of one of the finest range of hills in the world.

Once on pony back upon the ridge itself, with a fine day, a delicious west wind, a cloud-flecked firmament, what a sensation! We never were "up in a balloon," but this must be very like it. The ground falls away on either side, leaving you on a sort of back bone, with a sensation of being suspended in air, with a vast horizon on every side; and what a view! On the Herefordshire side what lovely sylvan beauty of hill and dale, towns and villages nestling in the most luxurious of woody landscape; in middle distance, Gloucester with its cathedral; Tewkesbury with its abbey and grand historical associations; afar off the Welsh mountains, with clouds resting upon them; a streak

of silver, as far as the eye can reach, is the Bristol Channel, sixty miles away. Then turning northwards, the eye ranges over a vast plain, the valley of the Severn, rich in fat meadows and luxuriant cornfields, bounded by the hills dominating the vale of the White Horse. Eastward, Malvern itself nestles at the foot of the grand Worcestershire Beacon, and over that shines the tower of Worcester Cathedral, standing up distinct and clear amidst the group of houses and factories which cluster round it.

So let us clamber to the roof of the well-appointed four-horse coach, and by the lovliest highways and byeways we, in an hour and a-half, clatter up Foregate Street to the Cross, and are in the midst of the quaint old city, with its old-fashioned houses, picturesque roofs, and narrow streets. Worcester is the seat of the celebrated Royal Porcelain Works, which for the last 150 years have turned out some of the most delicate and artistic of English work in porcelain; it is called "Royal" because George the Third, visiting the works in 1788, granted his warrant permitting the establishment to be so designated, and well deserves its name, not only on account of the superb works of art produced in the ateliers, but also for the right royal hospitality with which it receives visitors, and permits them to view the interesting series of operations involved in the production of the higher branches of ceramic art.

In an article upon ceramic photography it might scarcely be thought necessary to touch upon the manufacture of the porcelain itself; and so long as photography is content to produce pictures upon enamels specially made, and of comparatively small size, it would seem to be quite superfluous; but when it becomes a question of employing photography as a decorative art, and to apply it to porcelain, it is absolutely necessary that the operator should have some knowledge of the substance he is working with, the manner in which it is glazed, and the colours he proposes to employ to this end. Therefore the reader will be introduced to the various stages of porcelain manufacture with a view to arriving at a competent knowledge of the subject in an enlarged and commercial sense.

The materials of which Worcester porcelain is composed are not found in the locality in which the manufactory is situated, so that the trade cannot be said to be indigenous. Doubtless, in former years, considerable difficulty was experienced in obtaining the necessary materials; and it was not until Brindley opened out the district by his system of canal navigation, and later on, George Stephenson, with his iron road, made facilities for transit unknown before, that the Worcester porcelain became important commercially as well as artistically.

The visitor who joins a party of four or five, in the waiting room, having the same object in view as himself, is conducted, first of all, to the room in which the materials are ground. The mills are vast tubs, paved with a very hard stone called chert; in the middle revolves a vertical shaft, attached to which are four strong arms, carrying circular stones which, when the machinery is in motion, travel round the inside of the tub, and thoroughly crush up and disintegrate the material placed therein.

The principal ingredients of porcelain are china clay or kaolin, petuntse (which is a decomposed granite rock found in Cornwall) felspar from Sweden, and calcined bones. The use of the latter article makes the chief difference between English and Continental porcelain, the former being known as soft, the latter as hard, porcelain. These ingredients having been placed in the tubs with a sufficient quantity of water, the machinery is put in motion, the ponderous stones begin to revolve, and the grinding goes steadily on, sometimes for days, until the whole is ground into a greyish looking soup. The materials having been thus separately ground, now pass into what is called the slip house, and the various ingredients comprising the porcelain are here mixed together, being stirred up by machinery having radiating arms fixed on a vertical shaft. These arms are provided with powerful magnets, and as they move through the fluid the particles of iron which may have been present in the raw material, or may be the result of abrasion of the machinery, are attracted by these magnets, and are thus prevented from sullying the delicate print of the porcelain by their presence.

The material, which is designated *slip*, now passes through a series of sieves of exceedingly fine silk lawn, which allow nothing but the perfectly ground mixture to pass, keeping back all the coarser particles. The next process is to get rid of the surplus water, to which end the slip is pumped into what is called the clay press, a machine with a number of chambers lined with linen bags; the slip is subjected to hydraulic pressure, until sufficient of the water is squeezed away to cause it to assume the consistency of dough.

The dough is next taken to a vault called the clay cellar, and is there subjected to a most complete kneading, with a view to giving it consistency and toughness; this is the material used in the actual manufacture of porcelain; to the eye it is a greyish-looking mass, the particles composing it being of exceeding fineness; to the touch it gives the idea of great toughness and tenacity.

The ancient method of making circular vessels was by means of the potter's wheel, perhaps the most ancient mechanical contrivance of which any record has been preserved. At the Worcester Porcelain Works this mode of making cups and basins is shown greatly to the gratification of visitors, although the process is not used for business purposes. It is very interesting to see the potter take the lump of clay, which has been previously carefully weighed by his assistant, throw it on his wheel, which revolves horizontally, then with deft and practised fingers, fashion and mould it, and presently there comes up, under his skilful hands, the most delicate and elegant form in the plastic material; to this he affixes a handle, which has been pressed in a mould, merely using a little of the fluid slip, which forms a most powerful junction between the two.

Most of the articles manufactured in porcelain are made in moulds, and the visitor notes with some surprise the large size of the familiar objects: this is to allow for the shrinking in the firing; the pressed and moulded articles are stored in a drying-room, preparatory to being placed in the gigantic kiln, where they will be exposed for hours to an enormous heat.

The kiln has the appearance of a circular room dome-shaped, the centre going up into a sort of wide chimney; this is about fourteen feet in diameter, and has six or eight furnaces arranged at intervals round it. It is built with fire brick, and encircled with strong iron bands. The entrance is by a doorway, and the articles to be fired are placed in the kiln in what are called seggars, which are cases made of fire clay, and of shapes suitable for the various articles to be placed in them. Each large piece has its own particular seggars, in which it is carefully placed, imbedded in calcined flint. The smaller articles are placed several together, but always imbedded in the powdered flint, and properly supported to prevent them getting out of shape.

The seggars being filled with the ware are now placed in the kiln, piled one above another in the most careful manner; the proper placing and filling up of a kiln, containing, perhaps, many thousand pieces of valuable ware, being a work requiring great skill and experience. As soon as the kiln is full, the doorway is bricked up, the great furnaces are lighted, and for forty hours are kept going. The kiln becomes heated, then red-hot, then at a white heat; when the whole interior seems to be a mass of incandescent fusion. On looking through one of the small trial holes, the eye sees nothing but a blinding white heat, which strikes through the hole through which you have been peering, with most unmistakable power. This terrific heat is kept up for some forty hours or so; then the kiln takes forty-eight hours to cool. The doorway is broken

open, and the articles inside have become the delicate and fragile porcelain known as biscuit ware.

(*To be continued.*)

The "Topic" for next week will be "On the Advantages of a Note-Book to the Professional Photographer," by J. Vincent Elsden, B.Sc. (Lond.), F.C.S.

THE BRITISH ASSOCIATION.

[FROM OUR SPECIAL CORRESPONDENT.]

Swansea, Wednesday, September 1st, 1880.

In the best of weather, the meeting of the British Association has come and gone, leaving in the minds of those who attended it some very pleasant remembrances, but without contributing in any very marked manner to the advancement of knowledge in a special photographic sense. Messrs. Glaisher, Maxwell Lyte, Dillwyn Llewelyn, J. Spiller, A. L. Henderson, J. Millar Thomson, W. Andrews, and H. A. Chapman were present, but although most or all of these gentlemen contributed papers in the Sections, or joined in the discussions, there was not, from first to last, any one communication of a specially photographic character.

Two *soirées* were held in the Pavilion, when electric illumination was resorted to, and on the last of these occasions Mr. Casella showed some of Crookes's radiant matter tubes in operation within a darkened room, besides a very efficient and useful instrument known as "Gimingham's Combination Blowpipe." Microscopes, spectroscopes, and a variety of optical apparatus were shown by Messrs. Browning, Ladd, and others, besides a new mode of illuminating microscopic objects, described in Section A by Mr. Philip Braham. This consists in using a tiny jet of oxygen directed through gas flame upon lime, so as to get a diminutive lime light, which, by means of the ordinary condenser, is thrown upon the object, and constitutes a very efficient and manageable mode of illumination. The same author showed large crystals of chloride and sulphate of silver slowly formed in strong acid solutions acting over a long period upon metallic silver.

Mr. Francis Galton's lecture on "Mental Imagery" was made the medium for the exhibition, on a grand scale, of some very interesting photographic results. In order to get more "characteristic idealizations," the lecturer had prepared, by the help of a local photographer (Mr. Gulliver), some transparencies obtained by the superposition of five or more photographic portraits, and these were thrown upon a large screen by the oxycalcium light. An Italian peasant, a Greek medallion head, portraits of lunatics and criminals (from Dr. Mann's negatives), and an "idealized Welsh parson," from five of Mr. Gulliver's series superposed, were shown, and very good generic portraits, combining the common features of each, were obtained in this manner.

The Swansea meeting has proved of special interest to geologists and metallurgists, as might have been predicted, on the one hand, from the professional leanings of the President, Professor Andrew C. Ramsay, and also from the favourable character of the locality for metallurgical study, the manufacture of steel, iron of all qualities, tin plate, copper, zinc, and lead being here carried out on the largest scale, and all the works were thrown open to us. The only allusion of special photographic interest made by the President in his opening address was the statement of the fact that there was no such thing as *pure water* to be met with in nature. Salt beds abound in all geologic rocks, and impart chlorine to all well-waters, so that only by processes of distillation can this element be eliminated. Rain water, in so far as it is ordinarily received upon rocks and drains through them, becomes thereby necessarily contaminated.

Dr. J. H. Gilbert, President of the Chemical Section, who delivered his address from the pulpit of the Huntingdon Chapel (Section B) on Friday, 27th ult., gave a full account of Dr. Siemens' recent experiments on the influence of the electric light and ordinary daylight upon the growth of plants and formation of chlorophyll, asserting that plants more speedily attain to maturity, with vigorous production of woody structure and brilliant colouring of the flowers, when night was annihilated by the illumination of the electric light.

The President of Section A (Professor W. G. Adams) made reference to the latest results in spectroscopic science, describing the researehes of Messrs. Huggin, Lockyer, Liveing, and Dewar, and finally stated that "Dr. Vogel has pointed out a coincidence of a line of hydrogen with H" (of the solar spectrum).

Many side allusions were made to matters photographic, such, for instance, as that by Lieut. G. T. Temple, who stated yesterday, in the Anthropological Section, that the Laplanders, or "Mountain Lapps," had to this day a supreme objection to the photographic camera.

There are a few other entries in my note-book, but the above represents pretty correctly all that was done in the special direction in which your readers are interested.

ROYAL CORNWALL POLYTECHNIC SOCIETY.

The following are the awards in the photographic department:—

First Silver Medal.—Mr. H. P. Robinson.

Second Silver Medal.—Messrs. Baker, Brownrigg, and Hills and Saunders.

First Bronze Medal.—Messrs. Arthur Debenham, Adam Distin, Hinley, Marsh Bros., and Thos. Whaite.

Second Bronze Medal.—Mr. Bridge.

HOW TO WORK PAPER SUCCESSFULLY.

BY H. A. WEBB.*

The paper, after being dried, is fumed for twenty or thirty minutes. It should not be allowed to get too dry before printing; for this will make a great difference in the printing quality of the paper. If it becomes too dry, it will print with less vigour than if in a nice condition for working. This change is quite noticeable in damp, rainy weather, when the paper prints up strong and somewhat red. In that kind of weather, we need it moderately dry.

The reason why paper that is kept slightly damp (and I mean by that just sufficiently damp to be pliant and easily worked) prints stronger and richer than when perfectly dry, can be accounted for in this way: when the sensitized paper containing albumenate, chloride, and nitrate of silver is exposed to the action of light, a subchloride is formed and chlorine is liberated; now, if the paper is slightly damp, the chlorine can more readily unite with a portion of the free nitrate of silver to form chloride of silver, and so a fresh supply will be formed for the light to act upon, and consequently there will be more silver to make up the image; as the light acts more rapidly in the shadows, it is here where we get the greatest supply of fresh chloride of silver, and necessarily more contrasts, and that is what is needed to obtain vigor and brilliancy.

In printing, no rule can be given, as that will have to be governed by the paper, the kind of toning-bath employed, and the extent to which the toning is carried; this can be learned alone by experience. I use a carbonate of soda toning bath, and carry the toning pretty far, and so need to print quite strong.

If the paper prints vigorous, with a clean, and what we might call a metallic, bronze in the strongest shadows, we may feel quite certain that, with equal attention and care in future operations, we shall obtain satisfactory results.

When through printing we prepare the acid water, which is made slightly warm in cold weather (just tepid),

* Continued from page 413.

taking one ounce of acetic acid to about one gallon of water; the prints, without any previous washing, are placed, one by one, in the acid water, care being taken to see that they are completely covered, and that they do not stick together; it is best to turn them over once after they are in, the same as when fixing. In about five minutes they will turn red; if the water is cold it may take longer, and for this reason I advise tepid water. If the prints turn a bright cherry colour immediately upon placing them in the acid, it is an indication of the silver being too weak; and, on the other hand, if they take a long time, or refuse to redden up properly, quite likely the silver solution is too strong.

The prints are removed from the acid water and washed in two or three changes of water, or until the water ceases to have a milky appearance.

The toning-bath, if a new one is to be employed, should be made a couple of hours before use, and as follows:—A sufficient quantity of water, which will be governed by the amount of work to be toned, and to this is added a portion of the gold solution, containing about one grain of chloride of gold; make very slightly alkaline with solution of carbonate of soda (washing soda), litmus-paper being used for testing, and I have found a small pinch of common salt an advantage; when commencing to tone, a fresh supply of gold solution is added, and made alkaline as before, being careful not to add too much of the soda solution, or there will be a tendency to blister. It will take from one to one and a half or two grains of gold to the sheet of paper; this cannot be calculated closely, as so much depends upon the character of the work and the extent to which the toning is carried; if the greater portion of the work is vignettes and not toned far, then it may be safe to calculate one grain to the sheet; but if the bulk of the work is plain, with heavy shadows and dark ground, and the toning carried on until the prints are purple, then twice that quantity, or nearly two grains to the sheet, may be used.

The toning should be carried a little further than is wished when the prints are finished; but as a rule they should be removed from the bath when they begin to be blue in the middle tint, but take them out while there is still a little red in the strongest shadows. If the silver bath is too weak, the prints will look measly, and tone up grey and flat, instead of a rich purple and vigorous; if the silver is too strong, they will tone slowly, and if they refuse to tone, and look weak and spotted, and seem just to bleach out and turn yellow, or of a pinkish tint in the lights, then, no doubt, the silver bath is acid, or not sufficiently alkaline for the paper.

The toning bath I have found to work better after it has been used a few times, so I keep it, pouring it back into the bottle, and the next day decanting off the clear solution, and the balance thrown into the waste toning bath, afterwards to be precipitated with iron solution. I know the theory is that with an alkaline toning bath the gold will be all thrown down, but in practice I do not find it so, for even after standing several days without using, I have found there was still sufficient gold held in the solution to tone plain paper prints, and for plain paper prints I now always use the old bath without any addition of gold, toning those first. The fixing bath may be made of one ounce of hyposulphite to eight ounces of water, and the prints allowed to remain in for ten minutes, keeping them moving; they are then placed in salt water to prevent blisters, about a pint of salt to a gallon of water, and left in this from five to ten minutes, and then removed to fresh running water to receive a thorough washing.

A word of caution here about burnishing may not be out of place, for I have seen the most beautiful prints spoiled by using the burnisher too hot, the tones completely ruined, most likely to occur if the prints are too damp when burnished.

In a few words, let me recall some of the points to be remembered in order to obtain success in printing. Keep the paper damp before silvering, so that it may take the silver uniformly and quickly, and also as a guard against one source of blisters. Always keep a sufficient quantity of solution, and never think of starting to silver without being certain of the condition of your bath, both as to strength and alkalinity. If you would have your paper print rich, do not allow it to become too dry before printing. If you would have your prints resist the atmospheric influences as much as possible, do not be afraid to tone them well. If these requirements are carefully attended to, success will follow.

Correspondence.

ART PHOTOGRAPHY.

Sir,—Messrs. H. P. Robinson and W. Heighway have both done much towards conveying instruction to students in art photography: will it be impertinence to suggest to these gentlemen that if they would publish a series of photographs with notes in illustration of the principles they have taught in their former works, it would do much for the beginner?—Yours truly, A Muff.

APPARATUS FOR THE MILLION.

Sir,—"It is quite a mistaken notion to believe that very expensive apparatus is essential for the production of good photographic pictures." I quote these words from your last number of "In and Out of the Studio," because they and Mr. Stone's letter remind me that low-priced apparatus of respectable quality was much more easily obtained in the early days of the art than at present. It is just about twenty-two years back that I purchased a mahogany stereoscopic camera with a capital pair of French portrait lenses fitted to it, all complete for the small sum of £2. This was the dealer's price, and he would have supplied more at the same price had I desired them. I have worked since with the highest-priced apparatus, but, looking back at a few old productions of the cheap outfit, I cannot say that, in all the essentials of artistic work, I have ever excelled the work done with this cheap camera and lenses. Where could I match them now on the same terms? I have looked at catalogues of second-hand dealers, thinking to resume the practice, abandoned for some years past, but I only sigh and reflect that I could furnish a good sized room for the cost of a modern outfit. No doubt the production of fair quality apparatus at a moderate price would lead to a great increase in the numbers of those practising, and would benefit both dealers and professionals by making photography still more popular than at present; but it is not essential that the price should be quite so low as Mr. Stone names, as the purchaser might have the choice of a somewhat superior quality of lens at a rather increased price, say a quarter-plate camera and lens complete for a pound, and they could be supplied at very fair quality on these terms.—Yours respectfully,

An Artist and an Old Photographer.

Sir,—I have sent a few photographs which were taken without a studio, and which perhaps you will examine and let your readers know what you think of them. No. 1 and No. 2 were taken on gelatine plates at one shilling and sixpence a dozen, with an exposure of about half of a second, the others by the wet process. I don't mean to say they are the best that can be made, but I believe they will go to prove that photographs can be produced with cheap apparatus. They were made with a square camera that will take plates up to seven and a quarter inches, and which I made for under ten shillings; the lens is not included at the price. I have used the above camera on an average three days of a week for two years.

I see Mr. Richard Parr wants further particulars about the five shilling camera. It would be made of metal; the

several parts composing it, I think, can be stamped out; I cannot at present give the exact size of the camera, but believe it will be about five and a quarter inches by four and a quarter inches, with a back focus of four inches. The dark slide is also of metal, and weighs about three ounces.

Please allow me to correct a misprint in my letter on page 407: kindly read for focussing-screw, focussing-screen.—Yours truly, H. Stone.

[Mr. Stone's pictures are really creditable under the circumstances, if not photographs of a very high order. One little landscape is certainly good.—Ed. P. N.]

WANTED, A WORD.

Sir,—Will you allow me, through the medium of the News, to make known the above want, and to solicit aid from its numerous readers in solving the difficulty? The *word* wanted is one of a neutral nature that shall take the place of the word *sitter*, to denote the person about to be or that has been photographed. In the infancy of the art, no doubt the word sitter was expressive and neutral enough, but now the case is altered, for sitting is not the order of the day, as I find in my own experience that I have to take people standing, running, walking, skating, swimming, stooping, and lying down, besides sitting, so that the word sitter is now quite inappropriate.

A word is wanted that will stand for all or any of these positions, which would prevent the anomaly of having to speak of a person standing, as the *sitter*.—I remain, yours truly, J. L. Berry.

Talk in the Studio.

The Wimbledon Marking Scandal.—A novel point of law arose last week in reference to the subject of photographing the prisoner, Sergeant Marshman. It appears that portraits of the accused were wanted for the purpose of getting up evidence, but the Court disapproved of such a course—at any rate, until its sanction had been obtained. The matter is thus referred to in the report. Lieut. Edye, the prisoner's friend, stated that certain overtures had been made through the sergeant-major of division, that the prisoner should be photographed for the purpose of identification. Every facility would be afforded, but if it were to satisfy a morbid curiosity, the prisoner would strongly object.—Major Ozzard, the prosecutor, replied that the photo. had been asked for to assist an inquiry now being made in aid of justice, and not to satisfy any morbid taste.—Lieut. Edye: I object on the plea advanced by the prosecution. The prisoner has no objection.—The Court having considered the point, the President said that the Court regretted, and were surprised at, the step that had been taken. They felt that if a photograph of the prisoner was required, an application should have been made to them. They would have considered the application, and if sufficient reasons were shown, they would have obtained the photograph required. Communications with the prisoner through the sergeant-major, without the knowledge of the Court, and without the approval of the commanding officer, they considered most irregular: and in future whatever steps with regard to the prisoner it might be considered necessary to take, the sanction of the Court should be obtained.—Sergeant-Major Powell, the senior sergeant-major of the division, was called before the Court, and reprimanded by the President, who said that the matter would be referred to the commanding officer.

New Illuminating Gas.—Mr. Thomas J. F. Regan, of Brooklyn, N. Y., has patented an improved process for making illuminating gas, which consists, essentially, in placing in a closed receiver a quantity of caustic lime, and pouring upon it as much naphtha or other light hydro-carbon as it will absorb, and then drawing from the receiver by suitable means the gas arising from the saturated lime, and forcing it into a gasometer. The lime absorbs a small quantity of water from the hydro-carbon, and also a small quantity of condensed petroleum or petroleum oil. The gas drawn off by the exhauster is permanent, and will remain uncondensed in the gasometer. This gas answers every requirement for illuminating and heating purposes, and may be produced at much less expense than ordinary coal-gas—in the United States.—*English Mechanic.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

Exhibition.—See last week's News. On the 24th September.

Nihil.—You do not evidently wash enough. Corrosive sublimate is the same thing.

J. Crowe.—The ammonium freely dissolves chloride of silver; if any of the latter remains in your film, this, as a matter of course, gets darker and darker in printing. We have known many a brilliant negative fade away in the very manner you describe.

Brighton.—Not unless you write. We make it a rule to give no recommendations of the kind you ask for.

J. L. L.—Certainly.

Microscope.—We have given the exact size. The largest of the bacteria shown us measured three times the diameter of a blood corpuscle, and a blood corpuscle measures 1-3200th of an inch. But these were monsters compared to the rest. As you say, the series represent a monument of patience and industry; only those who have worked with the microscope can have any idea of the labour involved.

T. Baker.—Turn it into water at once. Wash with a very dilute solution of carbonate of soda, if you wish still to keep it; but we should advise dissolving it as soon as you can. The red fumes are proof of decomposition, and guncotton should always be put into water as soon as these appear.

Thomas.—Good, but you must go farther with it. The paper must be washed after sensitizing, or it will discolour. You may either fume your paper with ammonia, or put the latter in your printing pad.

R. Gordon.—See last week's News; if you want further information than contained therein, see our issue for June 11th. Pictures to be sent in not later than 9 p.m., on the 24th of this month, to Pall Mall. We congratulate you on your success; you are quite right in what you say in your last paragraph.

H. Dages.—We have sent you the information you require.

C. E. Wyrall.—You must back your plates, that is the only remedy. Some say that all gelatine plates should be backed, but certain it is many require it. A piece of carbon tissue is a good backing, as it may be employed over and over again, but lamp black applied moist to the back of the plate answers very well. Remove it before you develop. Nothing else will give you the required density, but there are many good plates that do not require backing. Thank you for your promise; it might be suitable for our Year-Book.

X. Y.—You should add a little bromide solution.

T. Durdon.—Some say 25 per cent.—Mr. Bedford, for instance—but this is putting it rather high. If you get back 60 per cent. of your silver, we think you do very well.

Beddlington.—The lens is more suitable for portraiture than landscape work.

J. T. S.—Your question is a difficult one; we should, under the circumstances, simply advise you to keep the negative in your own hands, and print off as many as gou can. It is impossible to reproduce a picture as good as yours from a print. An outsider, under the circumstances, would have no legal right to reproduce; but, as the person you refer to is next of kin, it would not be wise to try the question.

W. J. Anckorn.—1. No. 2. If you have obtained permission from the sitter, none of his relations can revoke it. 3. Decidedly the property of the photographer.

Newcastle and Gateshead Dry Plate Co.—Received.

Brighton.—You must get an order from a Member of Parliament, but this will only admit you as a spectator. We think, with you, that the idea is a good one, but you will have some difficulty, we fear, in carrying it out. There should be no objection to such a course when the House is empty: any member could refer you to the proper person.

H. P.—It is no criterion at all; the paper may still be good, notwithstanding its smell; but we do not say that it is.

Citizen Soldier.—The right is let every year. Apply to the Secretary in plenty of time on the next occasion.

A. Z.—Plaster of Paris would do, but papier mache would be better.

Marie.—Marine glue would be the best material; it can be purchased of any oilman, together with a liquid for thinning it. Your only means of protection is a patent.

W. Martin.—Mr. Slingsby does not strip his collodion film, but coats and develops upon opal direct. M. Lafosse, of Manchester, does the same, we believe; but, at any rate, there is no reason why your pictures should appear stained. Try iridium toning.

The Photographic News, September 10, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Portrait Photographers and their Sitters—Daguerre's Panoramic Paintings—Pyrogallic Acid Development of Gelatine Plates—Photography and Notoriety.

Portrait Photographers and their Sitters.—The action of Seymour *v.* Stevens recently tried at the Bloomsbury County Court, and of which a report appeared in these pages, touches upon a sore point which is constantly the source of trouble between photographer and sitter. In this case the defendant gave certain directions to the plaintiff, which the latter faithfully carried out. The result, however, was not to the satisfaction of the defendant, and he objected to pay. How often does not this occur in the studio; a sitter insists upon something which the photographer knows will be a failure. The latter remonstrates, but in vain, and at last, "good easy man," he does his best to carry out the wishes of his customer. The consequence is dissatisfaction, and of course the photographer is blamed. Our impression is that to some extent the portrait photographer, like a stage manager, should be a despot. He either does or does not know his business, and in each case should take the responsibility. If he fails, either through ignorance or incompetence, then he deserves all the blame he gets; on the other hand, if he succeeds, then his reputation will be enhanced, because many successes are achieved when least expected by the sitter, and often when the means taken are totally opposed to the ideas (of course erroneous) of the sitter. Certainly when there is a difference of opinion as to lighting, pose, or dress, the photographer should make it clear that if he does that which in his professional judgment is wrong, the sitter must accept the result.

Daguerre's Panoramic Paintings.—It is somewhat curious to note how history, even in photography, repeats itself. The great panoramic picture now being produced by the aid of magnified photographs by M. Yvon was but anticipated by Daguerre, whose experiments on the action of light were mainly undertaken with a view to improve panoramic painting, and in the production of dioramic effects. Among his pictures which attracted much attention at the time of their exhibition, were "The Midnight Mass," "Landslip in the Valley of Goldau," "The Temple of Solomon," and "The Cathedral of Sainte Marie de Montreal." A writer in a long-forgotten periodical, "The International Magazine," speaking of these pictures, said: "In these, the alternate effects of night and day, storm and sunshine, were beautifully produced. To these effects of light were added others from the decomposition of form by means of which, for example, in 'The Midnight Mass,' figures appeared where the spectators had just beheld seats, altars, &c.; and again, as in the 'Valley of Goldau,' in which rocks tumbling from the mountains replaced the prospect of a smiling valley;" in other words, they were the now familiar dissolving views. Daguerre hoped to be able to apply the phenomena of chemical changes by means of light to the production of effects in his dioramic paintings, and what he failed in has now been accomplished, though in quite a different form from that he imagined.

Pyrogallic Acid Development of Gelatine Plates.—There is something else to be considered besides the reducing action of pyrogallic acid, when we treat the gelatine film with it, and especially when we have recourse to lengthen development; we mean its staining action upon gelatine. A film of collodion may be immersed for a quarter of an hour in a strong pyrogallic solution without becoming stained in any way, but it is rare indeed that pyrogallic solution does not leave behind it some sort of effect upon a gelatine plate. So far, we have only experimented with two samples of acid, and one of them gave a very brown tinge indeed to the gelatine film on prolonged immersion in pyrogallic. No doubt there are means of subsequently bleaching the film at our disposal, dilute hydrochloric acid, for instance, soon dissipating the unwelcome tint; but the use of hydrochloric acid and other bleaching agents is undesirable in the practice of dry plate work. As it is, we have quite enough to do to keep our films from frilling, what with the prolonged operations already necessary, and we certainly do not wish to add to these. Nor does the fault lie only in the pyrogallic acid, for some gelatine films we find —whether they are thicker or not—stain more deeply than others. Fortunately, however, we are not entirely dependent upon pyrogallic acid development, and we think if dry plate photographers were polled at the present moment, the advocates of oxalate development would be more numerous than those who still resort to pyrogallic development.

Photography and Notoriety.—The craving of the public for photographs of everything which, for the time, is the nine days' wonder, appears, indeed, to be increasing. The court-martial on the Wimbledon target-marker indicates this. It appears from a representation made by Lieutenant Edye, the "prisoner's friend," as he is in military-legal parlance termed, that overtures had been made to the prisoner by the sergeant-major of the division, on behalf of an official connected with the prosecution, to allow himself to be photographed. The prisioner had no objection to be photographed if the Court desired it for the purpose of the present inquiry, but he objected "if it was merely to gratify a morbid curiosity of the public." The explanation given by Major Ozzard of the matter, it must be confessed, has a very "fishy" look. According to this officer, Mr. Harvey, the Admiralty law agent, of Portsmouth, applied to the sergeant-major for the photographs of five or six sergeants of Marines required by the Admiralty, for purposes not having reference to the inquiry. The sergeant-major produced the photograph book, from which five were selected. Mr. Harvey then asked for one of the prisoner, and, finding there was not one, requested the sergeant-major to ask the prisoner if he had one. We are afraid, from the remarks of the President to the effect that the Court regretted and were surprised at the step which had been taken, there is a little more in this matter than meets the eye. The temptation offered by the sale of Marshman's photographs is by no means a small one, and as it was not likely a photograph would be secured if the object were directly explained, it is perfectly feasible that an attempt should be made (though we do not say that this attempt *was* made) to obtain it by a side wind. If this be the interpretation of the request to the prisoner then we are not surprised at his objection, and at the displeasure of the Court. The charge made against Marshman is a serious one in military, if not in civil, law, and whether innocent or guilty, it could not have been pleasant for him to know that he was being gibbeted in every stationer's shop in the United Kingdom. Besides, Sergeant Marshman has the misfortune of being—well, not to put too fine a point upon it—a rather plain man, and had his photograph been exhibited, it could not have failed to have been remembered. How delightful it would prove to be recognised and pointed out in connection with such a charge whenever you enter an omnibus, a railway carriage, or a place of amusement.

ROYAL CORNWALL POLYTECHNIC SOCIETY.

The Forty-eighth Annual Exhibition of this Society commenced August 31st, remaining open one week as usual. The proceedings commenced with an address in the great hall by the president, the Rev. Canon Salter Rogers, who dealt with all the sections of the Exhibition. He said he was very pleased to see photographic art again so well represented, but regretted that not one example of Mr. Willis's platinotppe was amongst the collection of this year. He considered the specimens exhibited last year

he finest examples of photographic printing that he had ever seen. In looking round the present Exhibition the results in some of the photographs obtained were tru'y marvellous, especially in instantaneous photography. Mr. T. M. Brownrigg had some very elever studies, one of the subjects being a bathing party, one of whom was just taking a header; his legs and feet were perpendicularly out of the water, and no one could doubt for one moment the rapidity of the exposure. Neither Messrs. Marsh's frame of swans, nor the photograph of the well-known express train, "The Flying Dutchman," going at the rate of sixty miles per hour, could be passed by unnoticed. It was also very pleasing to see Mr. Robinson (of Tunbridge Wells) exhibiting again this year, and, as usual, he had taken the Society's first silver medal. Mr. Whaite's studies of interiors and little sketches on the beach at Brighton spoke well for the capabilities of the gelatine process. Mr. F. A. Bridge contributed a frame of photographs of botanical specimens of cones, which seemed perfect in manipulation, being photographed the natural size. Messrs. Hills and Saunders' (of Bayswater, London) contribution was one of the finest specimens of portraiture he had ever seen; the printing on opal was quite new to him (the President), and did the firm very great credit. Canon Rogers also briefly alluded to the other exhibits in the department, which brought his remarks on the photographic section to a close.

The general attendance at the Exhibition during the week was good.

On Wednesday evening, Mr. William Brooks (of Reigate) gave a lecture on the present aspects of photography, and the magic lantern and its construction, also the same instrument from an educational point of view, Rev. Canon Rogers in the chair. The first part was a general description of the gelatine process, with examples. Different printing processes were described, viz., silver printing, carbon printing, and the Woodbury printing process; the latter was illustrated by examples, the relief gelatine film, the impressed metal plate, and the finished print, being kindly lent for the occasion by the Woodburytype Printing Company.

The improved portable camera, and the scenograph, manufactured by the Sciopticon Company, were then exhibited and described, as, also, a pair of sensitometers by M. Léon Warnerke (of London). A sample of Balmain's luminous paint, after it had been rendered luminous by burning in front of it a few inches of magnesium wire, was next shown. Mr. Brooks then placed over it a photographic transparency on glass, which was warmly applauded.

Next was described the mechanical and optical construction of the magic lantern, and the manufacture of oxygen. Particular attention was called to several explosions that had occurred during the past few years. Mr. Chadwick's retort, &c., was exhibited and shown at work, which seemed to give great satisfaction. For schools and class exhibitions the sciopticon form of lantern was recommended, and one noticeable feature in the one exhibited was that for classes there was no occasion to put out the other lights in the room, as the image given was well defined, and perfectly distinct to admit of notes being taken by the students. Some fine specimens of the Woodbury slides were exhibited, which had been lent, including the sciopticon, by the Sciopticon Company, of London.

A series of slides was next exhibited of the wreck of the steamship *Brest*, which took place in September last year at the Lizard. These were greeted with a round of applause. A slide from Mr. Chadwick's negative, "Shooting Gulls," was also very much applauded, several of the gulls on the wing being well defined on the screen.

A vote of thanks was then proposed by Mr. Benedict Kitto, lecturer to the Miners' Association, and the proceedings terminated.

At Home.

MESSRS. RUSSELL AND SONS AT WORTHING.

The judges gave one of the few medals awarded last year at the Pall Mall Road Exhibition to Messrs. Russell and Sons, of Worthing, the particular picture securing the honour being a group of three ladies posed with rare grace and skill. This, coupled with another excellent picture—that of a rough countryman laughing and showing every tooth in his head, a laugh so infectious that you could not pass the portrait without laughing too—showed what good work could be done in Messrs. Russell's studio, and we were very glad, therefore, when opportunity permitted us to pay it a visit. The two pictures we have alluded to were so excellent that the judges must have had some difficulty in selecting the one to which the green label "medal" should be attached; they chose, as we have said, the group. We should have chosen the other.

This countryman picture deserves just a word of comment. It was the work, we believe, of Mr. Fielder, the principal assistant of Messrs. Russell and Sons, and was forwarded to the Exhibition as a result which had received "not a touch on the negative, nor a touch upon the print." Now this is a very important point, but, unfortunately, the information was by some oversight omitted from the catalogue. Had the fact been duly chronicled, not only the judges, but the visitors too, would have taken much more interest in the picture, for although no objection may be raised to moderate retouching, the absence of any working up—all things being equal—adds obviously to the value of a photograph. We mention this not for the purpose of questioning the judges' dictum, nor on behalf of Mr. Fielder—for to that gentleman was due the production of both studies—but simply to show the desirability for publishing the fact of a picture being untouched when this is really the case. Naturally, the artist prides himself a good deal upon this circumstance, and yet, despite its importance, it is ignored altogether. As to the jovial countryman himself, with his flowered waistcoat and unkempt hair, we may add something else, only our readers must take what we tell them in the strictest confidence. The countryman is an old hand at making people laugh, and that is why he succeeds so well in the picture; it is Mr. Harry Paulton, the comedian.

Messrs. Russell's studio is a spacious oblong apartment, measuring, perhaps, 30 feet by 16 feet. It has a northerly light, which is, however, only permitted to enter in moderation. There is a skirting-board four feet high, while practical blinds are capable of shutting out the side light. It is the top light that is most employed for illumination, but the glass here does not reach to the apex of the roof. Therefore the light above is not strong, since it comes, so to speak, from a window in the roof, and not through one whole half of the roof itself; moreover, the glass is rough and not clear. The curtains to admit the side light are adjusted when the model is seated; those nearest the sitter are light, and they get darker towards the camera end of the room. "Pronounced shadows and high lights should be in every picture," says Mr. Fielder, "but, of course, you want something besides black and white."

For taking any photograph above the size of a carte or cabinet, Dallmeyer's rapid rectilinear for 10 by 8 pictures is here used, an instrument which Mr. Dallmeyer himself, singularly enough, simply recommends "for general use out-of-doors." For the panel or promenade style, as we ourselves can testify, the lens is excellent, rendering drapery on the margin of the picture with marvellous Fritz Luckhardt-like detail. There is an ordinary chimney-piece and fender in the studio, and this is made to do duty with good effect, both in winter and summer; only, so it seemed to us, it was the lady who affected the mantelpiece and mirror in the summer time, and the gentleman, with his foot on the fender, in winter.

Of backgrounds there were very few in the studio, but a snow landscape deserved attention. The trunk of a tree with matted snow on one side, as the result of a drifting storm, was a prominent feature, but the white landscape was not overdone; the flooring was of canvas, with a few roughly-marked foot prints, and cotton-wool was employed to add to the effect. A grass ground was also very clever, made of green silk threads—one of Atkinson's, we were told—and with this some good recumbent models had been photographed: gentlemen lying at their ease on the sward, reading and smoking. "We have all sorts of possible and impossible accessories," said our host, "pointing to a large stock of furniture, "but we like to employ them as little as possible now-a-days."

The silver bath has been for some months past dispensed with at the Worthing studio, and only gelatine is employed; and this, strange to say, without any alteration to the dark room. This has an orange stained window and two tammy curtains. But the relief in being able to do without collodion was beyond description. The dark room is on the roof, and therefore exposed to the action of the sun, the consequence being that in summer the ether and alcohol fumes were well-nigh insupportable. "Only those who work in a dark room like this," said our host, "can appreciate the value of gelatine plates. The health question alone would be enough to bring gelatine into favour."

Messrs. Russell and Sons print a proportion of their work in carbon by the so-called chromotype method, "but it requires a very good negative to stand it," we were assured. Beside the printing room is an open flat roof that serves as an out-door waiting room for visitors. We thought of M. Liébert's "terrasse d'agrément," where models in waiting smoke their cigarettes; if he could only secure a prospect like this, the bright expanse of sea, the green waves and white cliffs extending as far as Beechey Head, our Parisian confrère would be happy indeed.

Gelatine plates have given little difficulty in the experience of Messrs. Russell. Never to proceed with a batch if the first or second film turns out questionable, is the invariable rule followed, and in this way much trouble and worry is saved. Gelatine plates, when good, are simple and easy to work, and when they give trouble the fault, nine times out of ten, lies in imperfect preparation. Therefore, rather than lose precious time in attempting to secure an inferior result with a second-class plate, the questionable batch is put on one side and returned. When the developer is once fairly at work on the film, one or both of the tammy blinds are drawn up, and the manipulation proceeds behind a single thickness of orange glass. From this it will be seen that Messrs. Russell and Sons do not prepare their own plates. They give two reasons for this, and it must be admitted that they are good ones. In the first place, they are quite satisfied with the films that they purchase; and in the second place, the time of their establishment is already fully occupied in camera and printing work. So long as it is possible to obtain trustworthy films at a reasonable rate, say Messrs. Russell, we shall prefer to leave the difficult work of preparing gelatine emulsion to others. They are very proud of their mounting material at the Russell Studio; as at many other establishments, the mounting of pictures caused a good deal of trouble and anxiety, but these have not been known since the employment of a material proposed in one of our Year-Books. Since that time the Messrs. Russell have never employed any other material, and seeing it has given so much satisfaction, we take this opportunity of repeating its composition:—

Best Bermuda arrowroot	... $3\frac{1}{2}$ ounces
Water	... 28 ,,
Sheet gelatine or glue ...	...160 grains
Methylated spirit ...	... 2 ounces
Pure carbolic acid ...	... 12 drops

Mix the arrowroot with 6 ounces of water into a paste, then add 22 ounces of water and the gelatine. Boil and stir for three or four minutes, then let it partly cool. Finally add carbolic acid and spirit; keep stirring till properly mixed.

The next "At Home" will be "Messrs. Brown, Barnes, and Bell at Liverpool."

ON THE REVERSAL OF THE DEVELOPED PHOTOGRAPHIC IMAGE.

BY CAPTAIN ABNEY, R.E., F.R.S.*

In the Proceedings of the Royal Society† I explained the theory of the reversal of the photographic image on development, showing that it was due to oxidation when ordinarily met with. On looking back, however, to the Philosophical Transactions for 1840, I find Sir J. Herschel gave a description of a similar phenomenon which perhaps might admit of a different explanation. This subject I examined some time ago; and since the whole question seems to have revived in interest, it has seemed an opportune moment to put on record my more recent investigations. I need scarcely say that the fact as to the reversal of the image is anything but new, as will be seen from Herschel's, Hunt's, and Draper's well known works. The explanation, however, as far as I know, has been confined to my researches already mentioned; and these were summarized very briefly.

Sir John Herschel, in his memoir just referred to, experimented on a prepared paper. In article 48 of his communication he says, "A paper endowed with a pretty high degree of sensibility may also be prepared with the following triple solution, viz.:—1st, acetate of lead; 2nd, hydriodate of potash; 3rd, nitrate of silver . . . . If paper so prepared and darkened in the sun be washed over with a fresh dose of hydriodate, the exposure to sunshine being sustained, it whitens with great rapidity; and were it practicable (which I have not found it) to ensure precisely the same ingredient-proportions, and the same degree of blackening in the sun to start from, I should not hesitate to propose this as an excellent process for a positive photographic paper."

This process in Sir J. Herschel's hand was not then uniformly successful; and it must be noted that here we are dealing with a visible image, and not a developable one. But it will be found that the same argument applies to both, since the visible image and the developable image are of precisely the same nature, varying only in the matter of degree.

It has been some time known, and more recently has been brought forward by Dr. Angus Smith,‡ that a slightly acidified solution of potassium iodide liberates iodine in the presence of light, though it remains unaltered in the dark for considerably long periods. If, then, paper impregnated with a silver-salt be blackened by light, and be then treated with potassium iodide, we have the exact explanation of Sir John Herschel's experiment, presuming the paper be slightly acid. When iodide of silver is exposed to light in the presence of a neutral solution of silver nitrate, we have this acidity produced, the iodine liberated from the silver iodide in its conversion to subiodide combining with the silver nitrate and liberating nitric acid, probably with the formation of an iodate. This is true more especially when the paper is not absolutely desiccated, for when desiccation is perfect the iodine might not combine. Hence may arise the uncertainty to which Sir J. Herschel refers. If paper so prepared be kept damp by any means, the reaction will invariably take place, and iodine from the potassium iodide will be liberated and combine with the semi-metallic silver on the paper to produce silver-iodide; in other words, the blackened surface will bleach.

The experiment may be tried in a variety of ways. The simplest, perhaps, is to salt ordinary unglazed paper with a 10 per cent. solution of common salt, and when dry to float it on a solution of silver nitrate of about the same strength, and then to dry and expose it to the daylight to blacken. When the blackening is produced, if the paper be slightly washed and then be treated with a 5 per cent. solution of potassium iodide (slightly acidified with nitric acid) in the dark, and while still damp be

* *Philosophical Magazine.*
† Vol. xxvii. pp 291 and 451.
‡ Since writing this paper, the author has noticed a paper in the Philosophical Magazine for August 1880, by Dr. Leeds, in which this solution has been investigated.

exposed *beneath a negative* to the light, it will be found that those portions beneath the transparent portions will rapidly bleach, and we shall have a *negative image* instead of a positive, but reversed as regards right and left.

The same experiment may be repeated, substituting potassium bromide for the iodide, and the same results will be obtained. It may be asked if any metallic iodide or bromide will be effective; and to this an affirmative answer may be given; but the use of acid is not necessary in all cases. Those metals which form two iodides or bromides must be used extremely dilute, or the bleaching will take place in the dark—that is, supposing the highest type of bromide or iodide be employed. Thus a strong solution of zinc iodide may be used and acidified, whilst a very dilute solution of ferric iodide must be used.

This, then, is the explanation of the reversal of the visible image, and it now remains to show that the same action takes place in the invisible image.

It is well known, if a plate be prepared with silver iodide by the ordinary wet process, be briefly exposed to light, and after washing be treated with a solution of potassium iodide and then be exposed to an image in the camera, that, after dipping in the silver-bath and developing, a positive image is obtained. It matters not whether the potassium iodide be alkaline, neutral, or acid, the same effect will be noted; also that there is no difference if, after treatment with the potassium iodide, the plate be washed or not, the reversal of the image will still be shown. In this case the iodine is liberated as before, but the action is increased by the access of oxygen from the air; in fact, it is a mixture of effects.

If potassium bromide or any simple bromide be substituted for the iodide the same result obtains. Silver iodide, if prepared with an excess of soluble iodide, or if, after preparation with excess of silver, it be treated with a soluble bromide, is insensitive to light; and the explanation of this perhaps may be found in the fact already stated.

It has been usually held that a soluble iodide, such as potassium, can destroy an invisible impression made by radiation; but this is not the case if it be treated with the iodide in the dark. If, however, any iodide, such as cupric or ferric, be employed, which readily liberates an equivalent of iodine, the destruction is accomplished in the dark. The least favourable iodides for such destruction, as I have already shown,* are the monads.

If a plate prepared with silver iodide have a preliminary exposure given it, and then be exposed *for a considerable time* to the image formed in the camera, a reversal of the image will take place as before. If, however, such a plate, after washing, be treated with an aqueous solution of pyrogallic acid, potassium nitrite, or any other deoxidising agent, such reversal of the image will not be obtained; nor will it if it be exposed in a cell containing such a substance as benzene, or if exposed in dry hydrogen. From this we learn that, to obtain reversal, oxygen must be present in some form or another, and that, if a substance readily taking up oxygen be in contact with the silver-salt a reversal cannot be readily obtained.

An interesting corroboration of the above statement is to be found in the treatment of an exposed plate in a cell containing a dilute solution of permanganate of potash, bichromate of potash, or hydroxyl, when it will be found that the reversal takes place with the greatest facility. The same reversals may also be obtained by using any of the mineral acids in a diluted form†.

The above experiments show, then, that a reversal may be obtained by the presence of the iodides or bromides (and in a more feeble manner, I have also found, by that of the chlorides), and also by oxidising agents and mineral acids; whilst the presence of a deoxidising agent, or the exposure of the plate in a medium free from oxygen, prevents the occurrence of the phenomenon.

We shall consider shortly as to whether the reversing action depends upon the sensitiveness of the salt of silver obtained by the preliminary exposure, or upon that of the agents employed in effecting such reversal.

With the bromide of silver we have rather different phases of the phenomenon to consider. The development can be carried out with the alkaline or the ferrous oxalate developer, a mode which is more easy to carry out than the development by precipitation of metallic silver from an aqueous solution of silver nitrate. For experimental purposes, films containing silver bromide may be formed of collodion or of gelatine; and the behaviour of the silver salt in the two vehicles is somewhat different, and has to be considered separately. Collodion is, or should be, a strictly neutral substance; that is, it is merely a medium in the pores of which the silver-salt is entangled and kept in position, and has no effect on the progress of development or on the action of light, beyond that which may be due to its physical qualities, its chemical constitution remaining unchanged.

A collodion film is essentially porous and not continuous, as may be seen by a microscopic examination; and free access of the atmosphere to the silver is thus obtained. Gelatine, on the other hand, is a substance readily acted upon by oxidising agents and by the halogens; and consequently it may have an effect on the progress of development and on the action of light, its chemical constitution becoming altered. It is a homogeneous film, and not porous in the ordinary sense of the word, and is a protective agency against the atmosphere to those silver salts which may be imbedded in it.

The most convenient method of experimenting with silver bromide is in the form of emulsion, made either with collodion or with gelatine; but it is not to the purpose of the present paper to refer to the mode of preparation beyond stating that in the former case the emulsion is usually prepared with an excess of silver nitrate, and the latter with an excess of soluble bromide, both of which are eliminated as far as possible by washing.

If a film containing silver bromide, whether in gelatine or collodion, have a preliminary exposure given to it, and then be treated with a soluble bromide of an alkali, such as of potassium, and be again exposed to light in the camera, it will be found that there is not such a rapid reversal of the image as with the iodide, but that longer exposure is required to effect it, the reason being that bromide of silver prepared with a large excess of soluble bromide is still sensitive to light. If, therefore, the light decomposes the soluble bromide on the plate, liberating enough bromine to form fresh bromide of silver with the sub-bromide formed by the preliminary exposure, that freshly formed bromide being sensitive to light, is again reduced to the sub-bromide state by the same rays which formed it. It will be evident, however, that reversal should take place more rapidly with the soluble bromide present than without it; and such is the case.

It is useless to treat a silver bromide film with a soluble iodide, since silver iodide is immediately formed, and the reactions that take place are similar to those already described.

If bromide of silver in collodion be exposed to the image in the camera without the presence of any other substance, a reversal takes place. Roughly speaking, the reversal takes some sixty times more exposure to the light than is requisite to produce the maximum ordinary effect. To trace the course of this reversal it is only necessary to treat the film with a 5 per cent. solution of potassium nitrite, when it will be found that the reversal does not take place. The same holds true when the film is treated with any deoxidising solution, or if the plate be immersed in benzene or hydrogen. The cause, then, of the reversal in this case is evidently an oxidation; and this may be further verified by treating the film, after a preliminary exposure, with bichromate of potash, hydroxyl, &c.; it will then be found that the reversal takes place much more rapidly than when these oxidising agents were absent. The same may be said of the mineral acids.

If silver bromide be held in a gelatine film, the action of light is somewhat different. If the plate be exposed in the camera for a short time, say a few seconds, the image develops in the usual manner and we have a negative image; if it be prolonged to, say, a minute, the image is reversed on development; a further exposure causes a negative image to be produced, whilst one much more prolonged causes a positive image again to be formed on development. Here are four distinct phenomena which need explanation. To solve the problem offered, plates should be exposed when saturated with a solution of potassium nitrite as before, when it will be found that the phenomena are absent, a reversal being almost impossible to obtain unless the length of exposure be such as to thoroughly oxidize the nitrite at the expense of gelatine. For ordinary purposes it may be said that a reversal is non-existent under these conditions.

(*to be continued.*)

* *Photographic Journal*, 1878.

† It must, however, be remembered that the solutions must be very dilute, or the whole effect of the preliminary exposure will be destroyed, since these oxidizing agents are active in the dark, but act more readily in the light.

PHOTOGRAPHY AS A DECORATIVE ART.

BY J. R. SAWYER.*

Porcelain.

The effect of the enormous heat to which the porcelain has been subjected for so long period has been to drive off every particle of moisture contained in the forms, which, by shrinking, now present themselves as having the accustomed sizes and shapes; the action of the intense heat has also fused the various materials composing the dough or tenacious clay, out of which the articles have been pressed or moulded, into a vitreous and transparent substance, known as biscuit porcelain.

The biscuit ware of Worcester is of a most lovely purity of colour; not a trace of the grey tone observable in the clay state remains, but a pure unsullied white characterizes the pieces. The next step is to cover the absorbent ware with a non-absorbent film or glaze. It would appear that the biscuit stage of the manufacture would be the most suitable, photographically considered, for applying the decoration, but as a matter of fact, at present, the skill of the decorator is not brought into requisition until a later period, when the ware has received its glaze.

The various pieces having been carefully taken from the seggars, and the powdered flint dusted from them, are carefully looked over, and all faulty specimens are put aside to be disposed of as wasters, and it is singular for what a very slight cause a piece is rejected. In most of the towns in the neighbourhood are earthenware shops where most lovely specimens, so slightly imperfect that their faults are non-apparent to the uninitiated, may be purchased for a few pence.

The perfect pieces are now taken to the dipping room. Here the visitor sees large tubs filled with a creamy-looking fluid. At these tubs stand men, who take the biscuit ware, and, holding it with a dexterity acquired by practice, dip each piece in the fluid in such a manner that the glaze shall be perfectly distributed over the surface; this is so cleverly managed that there is no trace on the finished article of the points where the articles have been held. From the dipping room they are next taken to the drying stone, the heat of which rapidly dries the glaze.

The dipped ware now goes into the trimming room, where it is carefully examined by women, who mend up any imperfect places, and otherwise make it perfect for the next operation, which is the firing, for the purpose of melting the glaze and causing it to cover the porcelain with that delicate bright enamel surface so characteristic of the Worcester manufacture. In the photographic decoration of porcelain the glaze has to be specially considered, as will be manifest when the mode of doing this has to be described. The glazes are of different degrees of hardness, varying with the practice of different manufacturers, and even with the different kinds of work turned out. Glaze is composed mainly of borax, calcined flints, and red lead, which, when fused by heat upon the surface of the porcelain, form a sort of glass. There is much secrecy about the composition of glazes, but the most easily fusible are said to contain more lead, whilst the most refractory contain a larger proportion of calcined flint. It will be seen presently, that in the application of photography to the decoration of porcelain, it is almost impossible to use any but the pure colour, and to depend upon the fuzing of the glaze already upon the ware for the burning in and glazing of the photograph; consequently a glaze that fuzes at a comparatively low temperature should always be sought for. As the potter and the photographer have scarcely as yet begun to work in alliance with each other, this is a matter that at present causes difficulties which, when better understood, may not arise.

To return to the dipped ware; it has been dried, examined, and the perfect pieces are now ready for what is called the "glost oven"; this is in reality a kiln very much like the one previously described, and in which the pieces are placed separately, and with the utmost care; the most extreme cleanliness is here a necessity, as particles of dust, or any foreign matter in fact, would settle upon the ware and spoil the result.

The pieces being all placed and the oven filled, the doorway is bricked up, the furnaces lighted. The whole is rendered incandescent by intense heat, and the operation is completed in about thirty-six hours; at the expiration of this time the oven has probably cooled sufficiently to enable the porcelain to be removed, and it comes out perfectly glazed of a beautiful white colour, and is now ready to be decorated by the painter and gilder, and is in the state in which, for the present at any rate, it is available for the purposes of the photographer.

In the decoration of porcelain, two distinct kinds of colour are employed, named respectively under-glaze and over-glaze colours; the former being supposed to be the oxides of various metals without addition, or with but a small addition, of the easily fusible substance known as flux, the latter being similar oxides with a considerable addition of this material. The writer of this article has no actual knowledge of this branch of the business except what he has derived from his own experiments and observations, for the manufacture of porcelain colours is a trade in which the secrets are guarded with the most jealous care; the various makers are perpetually striving to out-do each other, and if a colour is invented of a new shade, or of a superior brilliancy, the mode of its production is kept absolutely secret.

Fortunately, the decorative photographer needs only to work in monochrome, and provided he can obtain, or prepare, black, red, and blue, and manage to make them fuze at the same temperature, he has got over an initial difficulty; but it *is* a difficulty. Suppose that the red vaporizes before the black is glazed, it simply flies off and leaves a cold black, where a rich warm brown is desired; doubtless if the demand should ever become considerable, and the porcelain colour makers find it worth their while to understand the conditions of photographic decoration as applied to porcelain, the way will be immensely smoothed, but at present it is beset with pitfalls and difficulties in this direction. Assuming that a satisfactory colour has been obtained, the next question is how to apply it to the smooth, shining, and perfect surface presented by the porcelain. One method of doing this, and which has been already practised to some extent, is by the powder process. There are three formulæ given in Mr. Solomon's little work on Vitrified Photographs on Enamel, for a sensitive hygroscopic compound, which, when poured upon glass and exposed to light under a positive transparency, is hardened where the light penetrates, and becomes more or less susceptible to moisture according to the strength of the actinic rays acting through the various degrees of density in the transparency; one of these compounds, composed (say) of dextrine, grape sugar, and gum-arabic, sensitized by bichromate of ammonia, is poured upon a clean glass plate and allowed to dry in the dark; when perfectly dry, this is exposed under a transparent positive in a printing frame to the action of the light; when sufficiently exposed, it is taken into a room lighted by yellow light, and the oxide colour, ground to an impalpable powder, is dusted upon the plate; as the film attracts moisture gradually from the atmosphere the colour begins to adhere to the deep shadows, and finally the picture is developed in a colour that can be burned into porcelain or earthenware.

The picture, having been developed, is coated with a thick collodion, which, when dry, holds the picture thoroughly; the bichromate is removed by immersion in weak nitric or muriatic acid, which floats off the film from the glass, and it is now ready for the delicate operation of transferring to the piece of which it is destined to form a portion as indestructible as the porcelain itself.

(*To be continued.*)

* Continued from page 430.

The Photographic News.

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HYPOSULPHITE WASHINGS.

THERE is a wide difference of opinion among photographers as to the treatment and value of hyposulphite solutions which have done duty in fixing prints. Mr. Francis Bedford, as we said in our "At Home" a few months ago, always looks forward to recover from his hyposulphite washings a very large quantity of silver; no less, indeed, than half the amount derived from the waters in which the prints are rinsed on coming out of the pressure-frames. On the other hand, there are photographers, and their number is by no means insignificant, who do nothing at all with their hyposulphite washings. The washings "smell so," they say, and the small amount of silver they contain is not worth the trouble of recovery. This view of things can hardly be defended, for it is in this direction that economy should be pushed to the utmost by photographers. Many who are excessively chary of expenditure, and purchase low-class papers and inferior goods in order to save money, are at little pains to work economically, and the result is that they produce mediocre results at a greater cost than others who use only first-class materials. To quote Mr. Bedford's experience once more, it appears that by careful working as much as seventy-five per cent. of the silver actually employed in printing may be regained in one way or another; and when we hear of hundreds a-year being spent in the purchase of silver alone, the observance of economy must very frequently make all the difference between profit and loss in carrying on large operations.

A correspondent in these columns has reverted once more to the subject of recovering the silver from hyposulphite washings by the aid of metal plates. He prefers to use zinc plates laid at the bottom of the bath to precipitate his silver, rather than treatment of the solution with *hepar sulphuris*, or liver of sulphur. The latter is employed by Mr. Bedford, we may mention, and by most photographers who are wise enough to save their silver; it brings down the metal in the form of sulphide—a not very convenient form, it is true, but since photographers, as a rule, do not re-work their residues, but part with them to a refiner, this is of little moment. Metal plates, whether zinc or iron—for both have been proposed for the purpose—precipitate the silver in metallic form, and at first sight this certainly appears to be very advantageous. But, unfortunately, there is much else besides metallic silver collected at the bottom of the dirty baths, and until the precipitate has been thoroughly cleansed and separated from the foreign matter, it cannot be re-worked; therefore, from the fact that both products in the end find their way to the refiner, it is really of little importance to the photographer in what state the silver is that he recovers.

In a word, the photographer only wishes to gain from his hyposulphite washings all the silver it contains with the least possible trouble; if metal plates can be shown to precipitate more effectually, the photographer will only be too glad to use them; but, so far as our experience has gone, the addition of *hepar sulphuris* appears to be the most profitable mode of proceeding. In our recent experiments, we first made trial of three different metals—to wit, zinc, iron, and copper. An exhausted hyposulphite bath that had been used for fixing prints was divided into three equal volumes, and placed in three large beakers. A plate of zinc, six inches long and three inches broad, was then put at the bottom of No. 1 beaker; another plate of the same dimensions, but of iron, was placed in No. 2; and a similar plate of copper was put in No. 3.

At the end of a week the precipitate was collected, oxidised with nitric acid, and finally turned into chloride, by the addition of hydrochloric acid. The resulting amounts of chloride of silver were:—

Zinc plate	= 0·2008 gramme
Iron	= 0·1550 ,,
Copper	= Trace

The iron was thus shown to be inferior to zinc in precipitating silver, and under these circumstances its use was abandoned. The next thing was to ascertain the comparative advantages of liver of sulphur and zinc plates in recovering silver from hyposulphite washings.

Fifty prints measuring ten by eight inches were fixed in hyposulphite solution, and this was then divided into two portions. One half was treated with liver of sulphur; the other was placed in a beaker at the bottom of which a zinc plate measuring six inches by three was located. In the latter case a week was allowed before recovering the precipitate, while in the fomer, an hour or two only was necessary. But as time is of little object to photographers in operations of this kind, the fact is hardly of sufficient importance to be noted.

The silver recovered by means of liver of sulphur was of course in the form of sulphide; after oxidation and conversion into chloride, the result was:—

2·1183 grammes.

The precipitate furnished by scraping the zinc plate and filtering, was, after oxidation with nitric acid, also converted into chloride and weighed:—

1·6815 grammes.

There still remained silver upon the zinc plate, however, after scraping, and to estimate this, the zinc was treated with hot nitric acid of full strength. On the first treatment of the zinc in this fashion, silver was dissolved from the surface, equal in chloride to

·1265 gramme,

while a second similar treatment produced yet more silver, estimated as chloride at

·0100 grammes.

So that in all there was recovered by the zinc plate:

	1·6815 gramme.
	·1265 ,,
	·0100 ,,
Total	1·8180 gramme,

as against 2·1183 grammes recovered by the liver of sulphur.

In practice, however, it would never do to have to bathe the zinc plate with hot nitric acid, and therefore we must put the proportions down as—

2·1183 recovered by liver of sulphur.
1·6815 recovered by zinc plate.

·4368 difference in favour of sulphur.

In other words, we may look upon the proportions recovered by zinc and sulphur as 4 is to 5.

There is one other fact worthy of note in our experiment; it is the circumstance that a hyposulphite solution in which fifty prints measuring ten by eight inches have been fixed may be made to yield upwards of four grammes of chloride of silver, a result that sufficiently proves the wisdom of recovering the precious metal from hyposulphite washings.

Notes.

Mr. William England is in Switzerlaud with his camera, re-visiting scenes of his former triumphs; he was last at Chamonix, with Captain Abney and Lieutenant Darwin in company.

The late Mungo Ponton is said to have been the first to employ photography for recording the fluctuations in thermometer, barometer, &c., in our observatories, after the manner now adopted in Greenwich and Kew, which we recently described in these pages. The amount of tedious labour thus spared to observers, let alone the circumstance that photography does the work so much more accurately, may be gathered from a recent statement of Mr. Glaisher, F.R.S.

He says: "When meteorological and magnetical observations were first begun at Greenwich, observations were conducted unceasingly for seven years every two hours, day and night; nay, on some days observations were made *every five minutes* for twenty-four hours consecutively." Now all this watching and recording is done by photography, which has come to us just in the nick of time to aid in the development of meteorological science, in the same way as electric telegraphy has gone hand in hand with the development of our railway system. Mungo Ponton certainly deserved the silver medal awarded to him in 1845 by the Royal Society of Edinburgh for introducing photography as a useful maid-of-all-work in our observatories.

A change has come over the Swiss hotels. A few years ago the corridors and broad staircases were decked with florid pictures of attractive spots in the neighbourhood, and of hostelries "to be recommended," delightfully situated beside the bluest of lakes, with opaline glaciers of glittering crystal coming down into the back garden. But in an evil hour the assistance of the camera was invoked, and this tells a very different tale to that of the lithographer in colours.

In the photographs, the palatial proportions of the hotel "to be recommended" are considerably dwarfed, the pretty lake has receded at least a mile from the threshold, while the crystal glacier, instead of sweeping down to the very gravel walks, is seen far away, half way up the mountain.

Why is there so much difference of opinion on the subject of changing boxes? We hear of one maker who has supplied more than a thousand such boxes during the summer, while another maker, equally eminent, insists that six double slides can be made less in weight than a box to hold a dozen plates; hence, according to the latter, there is no advantage in the employment of the box, especially as the mechanism of the latter frequently leads to troubles. We should like to poll dry plate workers on the subject.

A correspondent writes that he can get on very well with the French weights, but is all at sea in the matter of turning cubic centimetres into English ounces. "Why can't we be satisfied with British measurements?" he asks.

We will tell him why. Because they lead so often to misunderstandings. Take, by way of illustration, the case of a silver bath to be made up according to English ounces. Silver, we know, is a precious metal, but are we to reckon silver nitrate at twelve ounces in the pound according to Troy, or at sixteen, according to Avoirdupois? When it is once made up into solution, then it will be a question of reckoning by twenty fluid ounces, and neither by twelve nor sixteen. Now, in the international language of chemists—no longer French—they talk only of grammes and cubic centimetres, which are practically the same thing, except that one is a weight and the other a measure.

As to turning cubic centimetres into ounces, or ounces, drachms, and scruples into cubic centimetres, nothing can be easier, if our correspondent will only follow the plan we have advocated time after time in these columns. It is one which involves no complicated ciphering, no tedious long division, no head-breaking equations. There can never be question of a mistake arising from an error in arithmetic, nor from stupidly dividing instead of multiplying; no puzzling rule-of-three, no practice to drive one mad.

Our plan consists simply in the purchase for a few pence of a graduated glass measure divided into cubic centimetres such as is in the possession of every chemist of the Old World and the New, and in taking care to have this always within reach. To turn ounces into cubic centimetres, you have then simply to turn water from your ounce measure into your cubic centimetre measure, and read off; to convert cubic centimetres into ounces you reverse the operation.

One word more as to British measurements: we must be careful what we call our own. To judge by the thermometers at present in every-day use, it would seem that nations prefer not their own, but other people's. It was Germany that invented the Fahrenheit scale, which we have appropriated, the Fatherland itself preferring to employ the thermometer of a Frenchman, Réaumur; while France, again, will have none of Réaumur, but uses the Celsius or Centigrade, whose introduction is due to a Swede.

The Celsius or Centigrade thermometer—it is fortunate the capital is the same in the two words—as everybody knows, has been chosen as the international measurer of temperature, since its degrees permit of being conveniently divided into tenths to express minute variations in the rise and fall of heat.

Beware of the black mounting cards usually employed for panel pictures. Some of them are evidently not to be trusted, for we have seen prints that have faded within six months. We presume there must be a sulphur compound of some sort in the black pigment.

It may not be generally known that "plague spots" in gelatine plates, those detestable blots that have been so rife with the hot weather, are to be recognised as easily before development as afterwards. By passing the fingers lightly over the surface of a plate in the dark, you can at once detect them. If a film feels like sandpaper, it is at once to be distrusted; a good plate should appear to the touch as smooth as satin.

The *Scientific American* of last month contains an article on "Protection against Forgeries, Photographic and Otherwise," which, on reading, we recognise to be no other than Mr. Spiller's valuable paper which appeared in our own columns. To meet old friends unexpectedly in this way is always pleasing. It never fails to remind us of the story of that Editor who at the moment of going to press was hurriedly called upon to supply a further column for his newspaper, and who met the situation calmly by sending for the *Times;* cutting out one of the Leaders, he hastily wrote at the top, "What does the *Times* mean by this?" and ordered it to be set up forthwith.

Topics of the Day.

ON THE ADVANTAGES OF A NOTE-BOOK TO THE PROFESSIONAL PHOTOGRAPHER.

BY J. VINCENT ELSDEN, B.SC. (LOND.), F.C.S.

Most of those who make a scientific study of photography no doubt keep a written record of their work, just as in the case of other scientific experiments; but to the professional photographer it would perhaps seem irksome to adopt so strict a method in his daily labours. Nevertheless, however troublesome it may at first seem, it appears to me of considerable utility to record the results of experience, even with respect to those methods which are already well known. Still more is this the case with certain details of manipulation, about which such opposite opinions exist, and such apparently diverse results have been obtained, as to perplex, rather than instruct, those who seek for information.

The result of this diversity of opinion has been to impress many with the idea that, in photography, chemical reactions are uncertain and capricious; that something akin to chance regulates photographic success; and that physical laws, when applied to photography, become clothed with metaphysical obscurity. It is only when accumulated experience shall have pointed out all the innumerable causes of failure that such unscientific ideas will be eradicated, and it is only by careful record of experiences that those causes can be determined with any accuracy.

It is a matter of complaint amongst many professional photographers that they have no time for experimenting; and yet they of all others frequently have the best opportunities of converting their daily experiences into real experiments by taking systematic notes of their work.

Many will no doubt smile at what may appear the absurdity of going to so much trouble. Others may consider their memory sufficiently good without any such elaborate process as keeping a written memoradum. Some may no doubt think such a step useful to the beginner, but perfectly unnecessary to the experienced; which brings me again to my previous complaint, viz., the too prevalent idea that the experienced cannot go wrong, but that their failures are due to capriciousness or impurity of chemicals, or to the obscure workings of chance.

Let me give a very simple illustration of my own experience of the utility of keeping a written record. Having developed half a dozen gelatine plates at night, I placed them to dry, and was unable to look at them for some days, during which time passing events drove from my memory nearly all the minute circumstances connected with them. I had, however, as usual, kept a written memorandum of those circumstances. When next I saw my negatives by daylight, three were brilliant all over; but the others appeared spoiled by a discolored band, two inches wide, at one end. Hydrochloric acid soon removed the stain, but its cause was still unexplained. On reference to my notes, I found that the spoiled ones were the first developed; but there was no difference in their treatment, except that on beginning the fourth, seeing the alum solution rather low in the dipping-bath, I had filled it with fresh solution. This seemed to point to the alum as a cause of the band of colour; and, on developing another plate and immersing it in alum to within two inches of the end, I got a similar discolored band; but another plate, wholly immersed in the alum, was perfectly clear after fixing. From this I gathered the important fact previously suspected by me, that alum acts powerfully in clearing the film from discolored developer.

In this way, by taking a very little trouble, I was able to draw a true logical inference as to the cause of the result, and to deduce from my unconscious experiment a general truth of some importance. Doubtless there are numberless cases in which important facts might be discovered amongst the many thousands of strange circumstances which the photographer must continually meet with in his daily routine of business—strange, because to him inexplicable; and inexplicable, because he has no accurate data to guide him to an explanation. It behoves the photographer to treat his profession less as an art, and more as a science; to regulate his practice by more systematic method, even if it cost him time and trouble.

When he sees the same causes repeatedly produce the same result, and when he can refer his failures to some little mistake in his own manipulation, the most sceptical photographer will begin to have more confidence in the laws of nature, and less belief in the efficiency of blind chance.

The "Topic" for next week will be "On Printing and Toning," by Payne Jennings.

THE BRITISH ASSOCIATION.

[FROM OUR SPECIAL CORRESPONDENT.]

In continuation of the report given you last week, I would, in the first place, commend to the notice of those of your readers who are interested in the latest results of spectroscopic discovery, the capital resumé given by Professor W. G. Adams in his inaugural address delivered in Section A. Within the compass of twelve octavo pages the learned President of this Section succeeded in giving a popular interpretation of all the recent researches, which will be read with interest by those desiring information upon the latest discoveries in solar physics. This study may be further supplemented by reading Dr. Schuster's reports on the present state of spectrum analysis (Influence of Pressure and Temperature on the Spectra of Gases, and on the Spectra of the Metalloids) which followed closely upon the delivery of Professor Adams's address, and Professor A. K. Huntington's report on Spectrum Analysis (ultra violet spectra) read in Section B.

Finding the Heights of Clouds.—Mr. Francis Galton read a paper upon "Determining the Heights and Distances of Clouds." He said that this might be done by their reflection in a low pool of water and in a mercurial horizon. The calm surface of a sheet of water might be made to serve the purpose of a large mirror, in a gigantic vertical range-finder, whereby a sufficiently large parallax might be made for the effective measurement of clouds. The

observation of the height and thickness of the different strata of clouds, and of the rates of movement, was at the present time perhaps the most promising, as it was the least explored, branch of meteorology. As there were comparatively few places in England where the two conditions were found of a pool of water, well screened from wind, and of a station situated many feet in height above it, the author hoped, by the publication of this memoir, to induce some qualified persons, who had access to favourable stations, such as existed in Wales, to interest themselves in the subject, and to make observations. The necessary angles might be obtained with a sextant and mercurial horizon; but it would be convenient to have in addition a tripod stand, with a bar of wood across the top to support the mercurial trough, with some simple instrument for the rapid and rough measurement of altitudes.

On the Length of the Sun-spot Period, by Dr. H. Muirhead.—Those who wished to prove that our rain, our storms, terrestrial magnetism, harvests of grain and vintage, and even our commercial crises, were dependent upon the prevalence of sun-spots upon the face of our luminary, should first of all make sure of the real length of the sun-spot period. There was much difference of opinion amongst men of science upon this point, and the author had gone into calculations to show that the length of the period intervening between one maximum epoch and another was not 10 years, nor 11, nor 11·1, but seemingly 11·863 years, corresponding with Jupiter's period of revolution.

An Improved Heliograph or Sun-signal.—Dr. Tempest Anderson claimed to have contrived a heliograph or sun-telegraph, by which the rays of the sun can be directed on any given point with greater ease and certainty than by any instrument at present in use. When the sun's rays are reflected at a small plane surface, considered as a point, the reflected rays form a cone, whose vertex is at the reflector, and whose vertical angle is equal to that subtended by the sun. Adding to the size of the mirror adds other cones of light, whose bounding rays are parallel with those proceeding from other points of the mirror, and only distant from them the same distance as the points on the mirror from which these are reflected; hence, increasing the size of the mirror only adds to the field to which the sun's rays are reflected a diameter equal to the diameter of the mirror, and this, at any distance at which the sun-signal would be used, is quite inappreciable. By the author's plan, an ordinary field-glass is used to find the position of the object to be signalled to, and it is attached in the position of the ordinary sunshade, a small and light apparatus, so arranged that when the mirror is turned to direct the cone of rays to any object within the field of view of the glass, an image of the sun appears in the field at the same time as the image of the distant object, and magnified to the same degree, and the part of the field covered by this image is exactly that part to which the rays are reflected, and at which some part of the sun's disc is visible in the mirror. In this way not only was a larger space covered, but flashes were more vivid and appreciable.

Dr. Tempest Anderson also exhibited an "Improved Apparatus for Estimating Astigmatism," likely to be useful to opthalmic surgeons, but which cannot be made intelligible without the help of the diagram shown to the meeting.

Report on Gas Lighting.—This report was presented in the Chemical Section by Dr. J. Pattinson, on behalf of his Committee, and referred to the best means for the development of light from coal-gas. The reporters stated that great fluctuations of pressure occurred in the mines, and that being so it was necessary to have complete control over the pressure of gas supplied to the burners, in order to develop its light-giving properties to the best advantage. The pressure could best be equalised by automatic governors attached to the meter, and if the temperature of the gas be raised in close proximity to the burner, a considerable increase of light was the result. With ordinary Argand burners, the best effect was got by burning the gas at one inch pressure.

The Mumbles Lighthouse was thrown open to the inspection of a small party of scientific excursionists on Saturday, 28th ult., and a submarine lamp for divers' use was on view every afternoon in the North Dock Basin, Swansea. This seemed to be very efficient if employed in moderately clear water. The lamp burns petroleum, and the combustion is kept up by a constant stream of pure air, supplied by pumping into the lower part of the lantern case. Colonel Shakespear exhibited his improved miners' safety lamp, having a thick glass cylinder to protect the wire gauze. The electric lighting at the Pavilion was not equal in steadiness and brilliancy to what we have seen exhibited in London.

ROYAL CORNWALL POLYTECHNIC OFFICIAL REPORT.

THE judges have great pleasure in congratulating the Society on the quality and general excellence of the exhibits, although the number is about the same as last year, which was considered slightly below the average of former years. Again the gelatine process is well to the front, and with good results; more than two-thirds of the pictures exhibited have been taken by it, both by professionals and amateurs.

SECTION 1.—*Professional.*—H. P. Robinson, of Tunbridge Wells, has been awarded the Society's first silver medal, for his excellent production, "At Gwysaney Hall"; it is one of the finest photographs of the kind that we have ever seen, and taken on a gelatine plate. Mr. Robinson's are so well known it would be useless for us to attempt to describe them in detail. He sends also several other works. "A Study of Sheep," "In Maiden Meditation Fancy Free," and "Dorothy," being an interior with a female figure most artistically posed.

Messrs. Hills and Saunders, of Bayswater, have been awarded a second silver medal for a portrait study of a boy, printed in carbon on opal; if it had been a direct negative, a first silver medal would have been awarded. Independent of the pose, it is soft, delicate, and brilliant, and the effect is truly wonderful.

Mr. Arthur Debenham, of the Isle of Wight, sends a fine collection of portraits and studies, very soft and delicate, to which a first bronze medal has been awarded.

Mr. H. G. Cocking sends three frames, namely, "A Country Election Agent," "Desolate," and "Nancy Lee." The first-named cannot be admired, being rather coarse and somewhat vulgar. The other two are far below the average of Mr. Cocking's work of former years.

Mr. E. S. Baker has been awarded a second silver medal for a landscape, "A Worcester Lane." It is a very artistic production, and a well-chosen subject.

Mr. A. B. Thom sends two—"Returning from Market," and the "Elephant, Jumbo, and his Keeper Scott," which possess some very good points.

Messrs. Lock and Whitfield send some fine productions in carbon, being very rich in tone. Especially noticeable is a portrait of a gentleman, and a study, "The Babes in the Wood."

We again have some of the admirable work of Adam Distin. "Relics of the Past" is very fine; a cottage interior with an old woman turning out the contents of an old box; this has been awarded a first bronze medal.

Mr. J. Milman Brown contributes a series of rustic studies, &c., "A Walk in Shanklin Chine" being the most effective.

Mr. T. G. Whaite, of Brighton, has several frames of studies, principally interiors (drawing rooms), and bits on the coast at Brighton. They are very brilliant, and very fine in tone, and speak well for the capabilities of gelatine. A first bronze medal has been awarded to the series.

Mr. Reuben Mitchell sends three frames, the best of which is Tynmouth Harbour, near Devon; but we think he is not quite up to his usual standard.

A very interesting series has been sent by Marsh Bros., of Henley-on-Thames, one frame of instantaneous studies of swans, which are very soft and delicate; also an instantaneous photograph of "The Flying Dutchman Express" going at the rate of sixty miles per hour; it is quite perfect in every respect, taken on one of Fry's gelatine plates; also is noticeable Henley Regetta, and Angling on the Thames. A first bronze medal has been awarded to the series.

J. Newnham and Co. send two composition pictures, which are rather under-exposed and heavy.

Mr. J. B. Blow sends two enlargements of a Cornish fishing village, printed in carbon, the effect of which is marred by the skies being left blank.

Mr. F. A. Bridge has been awarded a second bronze medal for a frame of botanical studies, natural size (cones), which show great skill in manipulation; he also sends a very fine enlargement in carbon of the students of the City of London College.

Mr. Edgar Gael, of Falmouth, has some very good examples of portraiture taken on gelatine plates, which are very delicate, soft, and brilliant, and well lighted.

Mr. J. W. Moor, also of Falmouth, sends several frames of portraits.

Section 2.—*Amateur.*—Mr. J. M. Brownrigg is well to the front this year, and has been awarded a second silver medal for a very fine collection. One frame is of Woodland scenery, taken on gelatine plates, which are better than anything we have ever seen of his; the other frame—instantaneous studies, one a bathing party—one figure is actually taken in the act of diving, with body mmersed, and legs and feet up out of the water, which is very remarkable; several street views, Guildford market-day being very fine specimens; the award being the highest given in the amateur department.

Mr. C. A. Fernley, of Reigate, sends some very good sketches, Tintern Abbey and some water scenes; and we note great improvement in his work to former years. These are also by gelatine.

A first bronze medal has been awarded to Mr. John Hinley, for a series illustrating Australian bush life, which are very interesting, and some of them must have been taken under very great difficulty.

Mr. C. G. Collins sends a few interesting instantaneous sketches of boats, which fully illustrate the rapidity by which boats in motion can be taken.

Mr. J. Jackson contributes four frames of studies, cabinet size, well chosen, but a little under-exposed; but, at the same time, possessing great merit in certain points.

Correspondence.

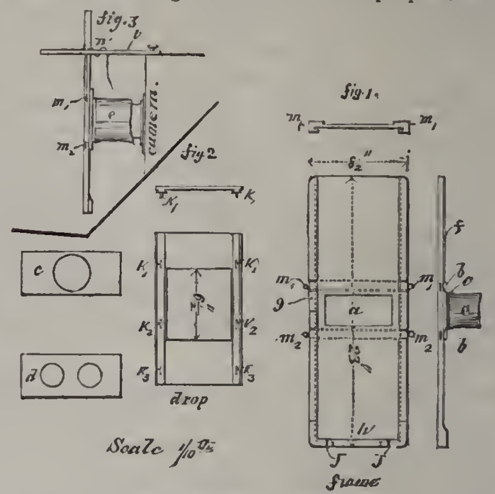
AN EXTRA-RAPID SHUTTER.

Sir,—In your issue of August 27th Captain Abney describes an "Instantaneous Shutter" made on exactly the same principles as one I had made for me from my own designs by Meagher several weeks ago. It is not, therefore, surprising that the two shutters are very much alike. As, however, mine has, I think, some advantages in the details of its construction, I send you a description of it.

The frame, fig. 1, is longer than Captain Abney's, so that the drop is always entirely within the grooves. This, I think, must diminish the friction, and, as will afterwards be seen, it allows the shutter to be used the other way upwards more conveniently, but at the cost of making my shutter somewhat heavier. This point must be settled by experience.

In the centre of the frame of my shutter is an aperture A, and at the back of the frame, above and below this, are rebated strips of wood, BB, which hold the slides C or D, according as a single lens or a pair of lenses is to be used; on the holes in these slides are fitted flanges on which are tied cylinders or sleeves, E, of flexible macintosh about six inches long. These sleeves are merely placed over the lenses, and perfectly exclude all light, even though the lens be considerably smaller than the sleeve.

The drop, fig. 2, has an aperture of about $6\frac{1}{2}$ inches, equal to four diameters of a rapid rectilinear lens which covers a 12 by 10 plate, and it may be diminished to any desired extent by placing pieces of ebonite in the grooves of the drop so as to close the bottom of the aperture, not the top. When not in use these ebonites should be stored in the back of the frame at F, in grooves made for the purpose, and not



in the drop, so as to keep the latter as light as possible. With strong springs, the heavier the drop, the more slowly it will move. The drop is retained at the proper height by a spring at G, which keeps the apertures of the frame and drop coincident for focussing, and fixes it again when it is raised quite to the top, at which time all light is excluded from the camera. This spring is released by touching a button at the back of the frame, when the drop falls quite to the bottom of the frame on to a strip of india-rubber placed there to deaden the blow, and all light is again excluded.

J, J, are eyelets screwed into the bottom of the frame, and to each of these is attached a loop made of a strip of pure india-rubber not quite long enough to reach to K_3 without stretching when the drop is raised; K_1 K_2 K_3 are brass eyelets screwed into the drop, and the india-rubber loop is stretched into K_1 when the greatest velocity is required and on to K_3 for a longer exposure. When K_1 is used the velocity is like that of a catapult. In my first trials of the shutter, when I used three springs on each side, and the bottom of the frame was comparatively slightly made, it was very soon broken off. This happened a second time even when it was strengthened with brass plates, for these were very quickly bent. It is now made so strong that probably a second or even a third pair might occasionally be used, but this can seldom be necessary.

The shutter is suspended from two strips of mahogany, L, fig. 3, which are fastened to the top corners of the camera by thumb screws. Strips of india-rubber are fastened to the eyelets, M_1, on the frame and when the shutter is to be used these are merely threaded through four of the holes in the mahogany supports at N, so that the shutter is adjusted to its exact position in front of the lens with the greatest ease and without any rigid attachment to the camera. But as the springs when in action slightly raise the frame, reducing its weight, it is better, for reasons explained by Captain Abney, to slightly support the shutter with one hand.

When it is desired to give a longer exposure to the foreground than to the sky, the shutter must be suspended the

other way upwards from M_2, so that the drop is drawn upwards by the spring.

When the full aperture is used, it will be found that seven-eighths of the lens have on an average been acting during the whole exposure, which probably has not been so long as is given by an ordinary drop shutter with an aperture equal to only one diameter of the lens, in which case only half the lens has on an average been in action. A single spring placed on the side instead of the end of the frame could not possibly give the same velocity.—I remain, sir, faithfully yours, Joseph Paget.

CARBONATE OF AMMONIA FOR GELATINE DEVELOPMENT.

Sir,—As the best mode of developing gelatine dry plates at one operation, without re-development, is so much sought after by photographers, I would offer a suggestion as a dry plate worker of some ten years' experience.

Colonel Stuart Wortley, with his uranium dry plates some seven years ago, tried many experiments with developers, and I came up to town on two or three occasions to see his mode of developing the uranium dry plates. He exposed and developed several with me at his residence in St. John's Wood, both with carbonate and with liquid ammonia, and he pointed out that he always found the carbonate give greater contrast and density, and the liquid greater uniformity of action over the whole picture without the contrasts.

I always used carbonate with his plates with the result of most vigorous negatives, but sometimes too much vigour and contrast. I have tried carbonate with gelatine dry plates, and found it develop them exceedingly well, though I have not done much by way of comparative experiment in this direction; but as I have not seen this mode of development mentioned before, I venture to recommend it as worthy of trial. A saturated solution of carbonate of ammonia, with some glycerine added to it, and bromide solution ready at hand for the control of the ammonia if required, would give a simple mode of development.

The advocates of the wet collodion process are much given to deprecating the gelatine process as lacking in pluck and vigour, and giving results both tame and flat, and there is, undoubtedly, very much yet to learn as to certain and safe results with gelatine development. Your interesting "At Home" last week, giving an account of Dr. Vogel's emulsion development alone, shows this, when Mr. Robinson surprised the maker of the emulsion by producing better effects through his mode of development than the inventor of the emulsion could produce himself.

Francis W. Turton.

RELICS OF OLD LONDON.

Dear Sir,—In your issue of September 3rd, speaking of the Society for Photographing Relics of Old London, you say, "So far we as are able to learn, the Society has photographed—or taken steps to photograph—some half dozen bits of Old London; but so far this seems to be the only outcome, &c." I think, sir, you will be glad to learn that you are in error. The Society has been in existence since 1875, in which year they issued six views of the Old Oxford Arms, which was soon after pulled down; in 1876, the set of six issued related to Drury Lane, Wych Street, and Lincoln's Inn; in 1877, six of St. Bartholomew the Great and Cloth Fair; in 1878, Temple Bar and five other views. The photographing for the Society thereupon came into my hands, and since then I have taken more than fifty satisfactory views. The Society, as well as myself, are continually looking out for other old subjects, and shall be very much obliged for any information about any worth having and in any way possible to get at. In 1879 a set of twelve was issued relating to Canonbury Tower, Barnard's Inn, Christ's Hospital, &c. This year (1880) the set of twelve all related to the Charterhouse. I have now many negatives ready for use, and a long list ready for convenient times of taking; but each subject wants its special time of day, and special weather; so the work cannot be quickly done.

I hope to show a set of all issued at the next Photographic Exhibition. I may add, they are all printed in carbon.

I enclose one of the Society's prospectuses.—Yours very truly, Henry Dixon.

PHOTOGRAPHIC APPARATUS—A HINT.

Sir,—In connection with dry plates, there appears a very good opening for some advanced dealer or maker to bring out *light-tight double backs* that can be readily adapted to any camera now in use, the said backs to be sold at a moderate cost. There are plenty who have such cameras, and would readily buy the backs. Let them be made and sold so as to return a fair profit, &c. This hint may be worth attention.—Yours truly, The Old Hand.

THE PAGET PRIZE.

Sir,—Your remarks upon the Paget Prize Competition in last week's News seems to point to the fact that a really good process, be it gelatine or otherwise, is very much wanted, by which amateurs or professionals can prepare their own plates at very little trouble or expense; else why is it, as you state, that the manufacturers have out-distanced the amateurs, who week by week are becoming more content to purchase their own plates ready made, and to abandon experiments on their own account? The reason seems to me to lie in the fact that the gelatine processes as at present published are beset with difficulties; especially in the making of the emulsion, there is the time and trouble required, and also the cooking for days or boiling, and the washing of the emulsion.

If anyone would publish a process whereby those difficulties may be simplified or removed, I think he would confer a boon upon those amateurs and professionals who would like to prepare their own plates, but are compelled, for reasons above stated, to purchase them ready made.—Yours truly, R. Conyer Haydon.

Proceedings of Societies.

French Photographic Society.

A meeting of the Society was held on the 4th ult., M. Peligot in the chair.

M. Andra, in the absence of M. Perrot, fulfilled the office of Secretary.

M. Davanne announced that at the last meeting of the Society for the encouragement of national industries, the prizes and medals were awarded for the years 1878 and 1879. The highest prize (the Marquis of Argenteuil's), of 12,000 francs value, was awarded to M. Poitevin for his numerous studies and applications of photography. This reward is only given once in six years, and to those whose works have had a remarkable influence on general progress. M. Poitevin made most complete experiments for utilizing the insoluble properties of gelatine to which a bichromate had been added, and employed it in various processes of photographic printing.

M. Ch. Petit received a prize of 1,500 francs for his process of transforming the negative from nature into an engraved plate.

A platinum medal has been given to M. Chardon for his bromide of silver emulsion process.

A silver medal was awarded to M. Pellet for the preparation of cyanofer paper.

M. Janssen sent a paper on the reversion of the photographic image.

M. Dujardin offered to the Society a heliotype portrait of Fox Talbot, which was from an ordinary carte, and enlarged. He also presented the engraved block, from which any number of prints might be taken. The Society determined to insert a copy

n the *Bulletin*, with a biography of F. Talbot, to be offered to the different societies in England.

M. LONDE presented the Society with a photograph, taken in an artist's studio, of models arranged and attired by the painter, as a sketch for his picture. The exposure was forty-five seconds in the feebly-lighted studio with a hemispherical lens.

M. THIEBAUT sent a gelatino-bromide plate, with an explanation. A small engraving was required to be reproduced the same size. M. Thiébaut wished to obtain a negative by placing a sensitive plate in contact with the engraving in a printing-frame, but with three different plates of three, two, and one seconds' exposure, succeeded only in obtaining positive results. He was certain that it was not over-exposure; but several present, after examining the plate sent, were of opinion that such was the case, and that one second's exposure by the light of a lamp would have sufficed.

M. PAUL DESMARETS exhibited two instantaneous pictures, taken while in a balloon at Rouen, and remarked upon the conditions under which they were obtained.

M. RENARD sent two large photoglyptiques on mica (Woodburytypes), remarking that sheets of such large dimensions were not easily obtainable.

Several persons present had tried the application of gelatino-bromide emulsion upon mica, but found that it not only required a substratum of collodion or albumen, but split and broke too much to allow of its being employed.

M. DAVANNE read an account by M. Civiale of the mode of construction ot his large map of the Alps, in which photography played an important part.

M. ROGER presented some instantaneous views taken at the distribution of "flags" upon gelatino-bromide plates.

Talk in the Studio.

SOCIETY FOR PHOTOGRAPHING RELICS OF OLD LONDON.—The sixth year's issue of this Society will consist of twelve views of the Charterhouse—the Grey Friars with which Thackeray made us familiar in the *Newcomes*. The Secretary of the Society is Mr. Alfred Marks, Long Ditton, Surrey, to whom application for membership should be addressed.

MEASURING THE VELOCITY OF LIGHT.—Professor Newcomb is engaged at Fort Whipple, U. S. A., experimenting on the velocity of light. The distinctive feature of his method, according to an American exchange, is a four-sided revolving mirror erected upon iron pillars. The mirror revolves at from 150 to 250 revolutions a second. The light reflected upon an ordinary mirror outside is directed through a tube and strikes the revolving mirror, and is reflected across the Potomac river a distance of two miles, where it strikes a mirror on Observatory Hill. It is reflected back again, and the point upon which it strikes is noted by a telescope attached to a graduated scale. By this means the exact time is easily secured, and arrangements are being made by which the velocity can be noted at much greater distance.—*Engineer*.

THE ELECTRICAL RAILWAY.—Siemens's electrical railway is running constantly every day at the Brussels Exhibition, and earning a great deal of money. It runs under bridges, whisks round and over bridges at the speed of a fast trotting horse. The engine is no bigger than a tea-box, and the driver sits astride of it with the brake and contact lever in his hands. There are three carriages, each carrying six persons, seated back to back, after the manner of an Irish jaunting car. The power being greatest when the current is let on and the coils of the locomotive are stationary, there is a sharp jerk on starting. In going uphill the current is also stronger than in going downhill, for the same reason, namely, that there is a greater difference between the velocity of the revolving coil in the stationary dynamo-electric machine, or generator, and that of the revolving coil in the moving machine, or locomotive, in the former case than in the latter. The electric railway is evidently quite a success, and we observe that an experimental line is being fitted up on the Camden and Amboy Railway in New Jersey, in order to test whether the system is applicable to the New York elevated railways.—*The Electrician.*

A PAPER OBSERVATORY.—The dome of the Rensselaer Polytechnic Institute Observatory, at Troy, New York, is built entirely of paper. It is reduced by pressure to the hardness of wood, and is laid on in sections one-sixth of an inch in thickness. The weight of the structure is only about one-tenth of what it would be if made of the usual materials.—*Engineer*.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. PIPER AND CARTER, "*Photographic News*" *Office*, 5, *Castle Street*, *Holborn*, *E.C. Advertisers are requested to make all Cheques payable to* Messrs. PIPER AND CARTER, *and crossed* "*Union Bank, Photographic News Account.*"

W. SMOKER.—Thank you for note. Jabez Hughes' Principles and Practice of Photography is a clear little book, advertised in our columns; Abney's Handbook, and Heighway's, both of which may be had of our Publishers, are also to be recommended. Our forthcoming YEAR-BOOK will give you the latest improvements, but you will gather them also from the NEWS. Both the lenses you mention are good.

J. T. SIMONS.—There can be little doubt the lithograph you send is a colourable imitation of your portrait; at the same time, the lithograph is of such an imperfect character, that it cannot compete with the sale of your picture; and we doubt whether any judge would, under the circumstances, grant an injunction. Even if he would, the expense would be too great to warrant you in taking proceedings. It is certainly very vexatious, but people really desirous of purchasing the portrait would not hesitate between the photograph and the lithograph.

H. W. A.—You will find in the Post Office Directory a dozen firms from which sheet gelatine may be purchased, if you look under the "Trades" section: if you want but a few sheets only, any photographic dealer could get them for you. A five per cent. bichromate bath will answer the purpose.

OSNABURGH.—Castor oil is added to the collodion.

J. T.—Five shillings, we believe, for amateurs; but write yourself to the Company.

M. MORGAN.—The firm is not now in existence.

MIKE.—Liver of sulphur is best; not chloride, but sulphide.

ENQUIRER.—The name occurs in Fabre's *aide mémoire*, as one of the principal photographers in Algiers.

W. W.—1. We do not believe much in the addition of one or the other, but of the two we should prefer the liquid; a few drops to the pint. 2. For preserving purposes, any strength of bicarbonate will do; say, make a saturated solution and dilute with an equal part of water.

T. F. LLOYD.—We have sent you a copy of the PHOTOGRAPHIC NEWS containing all the information that has been published. It is very strange you should have had no reply from the secretary.

W. J. D.—We have the series of photographs, and we think that they are quite worthy of exhibition—in sets, rather than singly. Robin Redbreast has certainly proved a steady sitter, and perhaps his portrait might be enlarged with advantage. But the photograph is quite a feat as it is. What a pity he chose so dark a background! "Fairy-land" we consider one of the best of the series, since it is both clear and soft; one or two of the others have something of that "sapless" quality so inherent to dry plates. Thank you for your two hints, both of which will appear in our "Notes" at the first opportunity. We will keep the pictures with pleasure.

A. GORDON.—Tinted albumenized paper may still be purchased, but it is little used now—at any rate, in this country. It is most of it of German manufacture.

H. GREGORY.—Certainly, if you will send us a print.

W. WHITBREAD.—See our advertising columns. Mr. Werge can supply you with Spence's metal.

S. G. O.—See above. It melts at a temperature a little above boiling water. If you want a large quantity of it, apply to Berger, Spence, and Co., 31, Lombard Street.

W. W.—Zinc is better than copper; it brings down the metal more quickly and completely; but in your case the addition of hydrochloric acid is better. There was possibly a good deal of foreign matter or dirt in your residue, hence the discrepancy. If the weight you give us was all dry chloride of silver, you certainly made a bad bargain.

A. JOYCE.—The patent expired some months ago. Everybody has been waiting this event before taking up the process. If you will send us a note we will forward it to Mr. Woodbury.

HOPE.—We ourselves have secured a picture on a small plate through a double thickness of ruby glass held in front of the lens. An orange and ruby combined are, however, quite safe. The paper, if not in the market, will be so very shortly. You had better write direct to Messrs. Mawson and Swan (see their address in our advertising columns).

J. MURDOCH.—You must get a licence, but it only costs five shillings, we believe, to an amateur. The sample of hyposulphite you send is perfectly good; it is rather wetter than usual, but this may be due to imperfect packing.

NORSEMAN.—Rub the plate first with a little French chalk, and coat with normal collodion. The Autotype Company can supply you with it as red as you like. Both Monckhoven and Marion.

The Photographic News, September 17, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Swan's Electric Lamp—Photographing the Bottom of the Sea—Society for Photographing Old London.

Swan's Electric Lamp.—Mr. Swan, whose name has been so long and so honourably connected with photography, has been for some time busily engaged in perfecting his electric lamp. The invention—the specification of which is now published—somewhat resembles Mr. Edison's principle; but Mr. Swan has sought to prevent the cracking and leakage of the glass bulb or inclosing vessel in consequence of the heating and cooling of the conducting wires, which, when simply sealed into the glass globe, cause it to crack and leak at or near the junction of the wires and glass. The means used is the employment of a pair of caps of platinum as an attachment to the lamp globe, or a tube proceeding from it at the place where the conducting wires enter the lamp enclosure. Each cap is attached by the fusion of the glass around its rim. The conducting wires pass through, or into the caps, and the junction of the wires and caps is secured air tight by soldering. Where, however, the wire does not pass through the cap, but into it, soldering is not essential, a firm contact of the conducting wires to the interior of the caps is in this case sufficient. The second part of the invention has for its object the prevention of the rupture of the carbon within the exhausted glass bulb as the result of its unequal contraction. Mr. Swan has found that when the carbon employed within the lamp is an arch or horse-shoe-shaped plate, produced by cutting it out from a sheet of cardboard, and afterwards carbonising it by heat, the arch or horse-shoe-shaped carbon so produced is liable to become distorted, and ultimately to break in consequence of the unequal contraction caused by the unequal heating of the inner and outer portion of the arch during the usage of the lamp. This defect he remedies by forming the carbon, to be made incandescent, of a strip of cardboard or parchment paper, which, after being bent into the required form, is subjected to a white heat in a close vessel of suitable material (such as fire-clay), containing powdered charcoal or other suitable air-excluding powder. One or more of these curved carbon strips are mounted within a glass bulb by clipping their ends between forceps of platinum, or an alloy of platinum and iridium attached to the conducting wires which pass through or into the caps. The third part of the invention has for its object the prevention of the evolution of gas given forth by the conducting wires within the lamp, and Mr. Swan accomplishes this by coating the conducting wires within the lamp with glass or enamel. It will thus be seen that the defects which marked the Edison lamp are here sought to be overcome, and if Mr. Swan has succeeded, a most important advance in the use of the electric light has been made.

Photographing the Bottom of the Sea.—What has become of the photographs of the bottom of the sea, said to be taken by a Scotch photographer, some time ago? Did anybody ever see them, or had they existence only in "the heat-oppressed brain" of the imaginative liner? A good deal of talk was expended at the time, and a host of conjectures hazarded as to how such photographs could be produced; but as there was a remarkable reticence about the exhibition of the pictures we are almost inclined to think that the talk and the conjectures were but so much waste of time. Certainly all doubts would be set at rest if the gentleman who secured these curiosities of photography could be induced to show them at the Photographic Society's Exhibition next month. In the mean time the *Daily News*, in its desire to relieve the monotony which most visitors at the seaside experience, has given a description of a water telescope, which we are not at all sure might not be available for "sea bed" photography. "There are three forms of water-glass," says our contemporary, "namely, an ordinary bucket or barrel, with the bottom knocked out; secondly, a piece of tin, of a funnel shape, about three feet long and nine inches diameter at the broad (or bottom) end, and large enough to accommodate the observer's eye; into the broad end should be inserted a plate of strong glass, and some lead to weigh it down; thirdly, the simplest way is to get a tin or zinc tube like a map case; this should be about three and a-half feet long and three inches in diameter. The bottom of this also should be glass, and be weighted." These water telescopes are used by the Norwegian and Cornish fishermen; the former employing them in their herring and cod fisheries to discover shoals of fish that would otherwise escape their nets, and the latter in looking for wrecks, lost crab and lobster pots, &c., and, when the water is clear, an observer can see from three to twenty fathoms on calm bright days. It may, we think, be taken as a general rule, that what is visible to the naked eye in daylight may also be photographed; and by means of these instruments there really seems a possibility of taking a photograph of the bottom of the sea within a certain range. We do not imagine that cod, herring, or mullet will be conciliatory enough to sit—if this expression can be applied to fish—for their portraits, but it is quite possible that oysters, mussels, and perriwinkles, which are of a more sedate character, and not given to roaming, might be available. It is an undoubted fact that even in the roughest weather the agitation of the water extends but a very few feet down, and on a calm day the movement of the waves must be scarcely perceptible. The adaptation of a camera to a water telescope is a matter very easily accomplished, and we recommend those amateurs, who wish to eclipse the latest wonder achieved in instantaneous photography, to turn their attention to photographing the bottom of the sea.

The Society for Photographing Old London.—We are glad to find from the letter which appeared from Mr. Dixon in our last week's issue, that the Society for Photographing Relics of Old London has been much more active than we imagined. The work is undoubtedly a valuable one, as before many years are past there will be very little of Old London left. How interesting, for instance, would have been a photograph of the old Tabard Inn, and though probably not a vestige of the tavern immortalized by Chaucer could be traced in the building not long since pulled down, it was sufficiently antiquated to make a picture of it interesting. We presume that some inscrutable government rule and regulation prohibit the photographing of the interior of the Tower of London, as nothing seems to have been done with this—probably the most famous historic building in the world. There must be a whole mine of wealth within these old walls for the photographer, and in the days of a rapid gelatine process, badly illuminated interiors, impossible with collodion, can be attempted with some hope of success. Probably the "oldest bit of London" is the brick work of the old Roman bath in Strand Lane, so close to the busiest thoroughfare in London, and yet known to so few. We believe that a good deal of the ancient brick work remains intact, but, like most other earthly things, it must succumb some day to the spirit of change.

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."

No. 10.—Our Beanfeast.

My print of this negative will most likely make you laugh, and very probably call up some pleasant and similar recollections. I cannot tell you anything wonderfully practical about this one, simply because it is, as you may suppose, a wet collodion one; and now that we are all laying our heads and brains in the direction of dry plates—indeed, I may say that the latter has completely superseded the former, even in-doors as well as out—I do not think it

necessary on my part to enter into the details of a process that one might say is doomed.

Yet, and in despite of all our quick processes and dry plates, I cannot help lifting this negative up between me and the light and admire its clearness and depth—printing depth I mean—while comparing it in my mind's eye with the thin, non-actinic colour of the dry plate; there is a power, a lusciousness, a warm richness about it, that I have failed to observe in a dry plate.

It is a 10 by 8 plate, taken with a Ross' symmetrical; the exposure three seconds, with the second stop. I can remember it all as well as if it were only yesterday; it is not a very old negative—only five years ago—but what feelings the sight of it calls forth! Only five years! And where are all the members of that jolly party now? Some have gone abroad to fulfil good engagements; some have gone, I don't know where; others have gone to the bad; and, last of all, five of the party are in their last long sleep.

There were forty-three of us, including myself, although in my negative I do not appear—it may sound like an Irish bull, but it is true. I daresay every one knows that a sitter who takes up a position *behind* the camera, as a rule does not appear. We had a four-in-hander, a glittering concern, and the nags were regular prancers. We were going from Stoke Newington to Thames Ditton—a little spot just beyond Hampton Court—and we were determined to do it in style. Hurrah! I feel my spirits rise with the thoughts of it. The morning was bright and sunny, the air loaded with perfume, and wasps and bees, and fumes of drinks and fragrant cheroots, and music. I feel jubilant. The perspiration engendered by toiling along with the traps to the point of starting went for nothing. We were *there*, so to speak. The only thing that annoyed me was that 'Arry *would* get on the box with his big hat (by-the-by, did you ever hear of an outing where 'Arry and his big hat did not appear conspicuously?); there were no less than fifteen of us wanted to get that seat, and the most outrageous of the lot got it.

"It is my prerogative," he declared; "and," he added, with a most determined aspect, "I means to 'ave it."

I told you we had music. We had a solemn-looking chap with a cornet—a silver one, with an inscription on it—who took umbrage at 'Arry for usurping the box seat, but who revenged himself upon the whole company generally by blowing shrill blasts of defiance the first few miles of the way. Then we had a comic musician with the most awful horn that ever grew on a cow's head. The latter musician sat next to me—worse luck!—and seemed to take an immense delight in pouring his fearful strains in my left ear. This was great fun to 'Arry and the rest of the company, but it left me deaf for nearly a week; still, music hath charms!

Now we are all on the way. The horses are stepping it; the coachman's whip is clicking; 'Arry is doing the big with a cigar, and lifting his hat to all the pretty housemaids we pass; the cornet and the horn are both beginning to get purple in the face; the houses are getting few and far between, and green fields and "mudlarks" appear in abundance. The latter is a great institution on the London roads. The whole way from the "Royal Oak" to Kew swarmed with them. Heels over head, round and round, picking up the coppers in their mouths, brown as berries, begrimed with dirt, healthy in their poverty, happy in their rags! By Jove! I envy the young beggars.

Just before we came to Kew we stopped at a wayside inn for refreshments. Here, to my amazement, we found one of a race nearly extinct; I mean one of those forty or fifty-year-ago fellows that wandered the country with a pair of scissors with which he would cut out your profile in black paper. This chap, who looked as lean and hungry as a greyhound, for the small charge of twopence cut me out a profile of my honoured self, and did me more than justice; he bestowed upon me one of the most magnificent Roman noses I ever saw, if one excepts the late Duke of Wellington.

I am sorry to relate that the cornet and the horn from words came to blows at this point, and it required all our persuasive powers to make them swallow each a glass of shandygaff amicably. I believe the dispute arose through the cornet demanding to get all the music (?) to himself.

However, we got once more on the road; the quarrel was settled owing to 'Arry, having smoked himself sick, giving up his seat on the box to the cornet, and then going quietly to sleep in the near corner of the drag. Now we bowl along in rare form—over Kew Bridge, then along the road with rattle, roar, and song. A party of men do get lively—don't they?

There is Hampton Court; mark the river glistening in the sunlight, the foliage gently waving in the breeze, the towers rearing their heads in the clear sky. Now on we go. Here is Thames Ditton. The driver straightens up his back, rattles the "ribbons," cracks his whip; 'Arry wakes up from his nap, and resumes his big hat; the horn is forcibly held from sounding his diabolical notes; the cornet gives all the breath he has to "We won't go home till morning," and we rattle up in style to the hotel door.

It is very quiet, Thames Ditton. Its principal features can be recounted in a few words, viz., a hotel, a common, some donkeys, and a crowd of gipsies.

I took the negative in front of the hotel—a wet plate, as I told you—and I developed it in a cellar. It was a little thinnish, so I re-developed it with a weak solution of iron and citric acid—a re-developer that I used to prize very much.

Just as I had done, a "nut-brown maid" solicited the favour of looking at my hand—in short, she wanted to read my fortune; and as I had a particular desire to know all about it, I gave her sixpence (no change) and listened to the oracle. After stretching forth my hand, and letting this nut-brown maid scrutinize it, she spoke as follows:—

"You have enjoyed good health?"

Now, as I do not look as if I am going into a galloping consumption, I do not wonder at her singular commencement.

"You are married?" was the next half query, half suggestion.

"I am," I answered, with all the dignity of responsibility about me.

"I knew it," was her sage reply, while she glanced at my hand as though she wished to see through it. "You will be married just twice more; you will have fourteen children, and a near relation will leave you a splendid fortune."

When I heard this, I felt as if I loved that gipsy girl, and actually had the indiscretion to feel in my pocket for a stray threepenny bit that I fancied I had there. Now, do not mistake me; I do not covet the other two wives, or hanker after the fourteen children (ye gods!), but that splendid fortune! I sometimes dream of it, a sort of Jacob's ladder, which disappears whenever I waken; but, as the old villains in the melo-dramas used to declaim, "No mat-tar; the time will come!"

Like every outing, we ended very tired. I got my negative safely home to London. Every one—horses and all—were steady; but 'Arry, I was really sorry for him, he behaved in a most outrageous manner on the way home. First he wanted to drive, and then wanted to fight the coachman because he would not let him; then he expressed a desire to stay behind, declaring that we were the most disagreeable fellows he ever saw, and that we knew "nuthin." When we did get him in the drag, he inflicted a comic song upon us, of which he could remember only one line. I believe he went to bed with his hat on that night. 'Arry was wrong, I think.

At Home.

MESSRS. BROWN, BARNES, AND BELL AT LIVERPOOL.

There was no reason to go all the way to Liverpool to visit a studio of Messrs. Brown, Barnes, and Bell, for London contains two of their establishments, and there are a round dozen of others in the principal towns of Great Britain. But it is at Liverpool that the firm is "at home," and to Liverpool we accordingly journeyed. Even at Liverpool we did not visit the whole of the premises occupied by the firm. We were, we frankly admit, only at the principal studio in Bold Street, and at the principal printing and mounting establishment in Mount Pleasant; but it will be difficult, nevertheless, within the space of this article, to give an adequate account of what we did see of the doings of this enterprising triumvirate of photographers.

We have inspected a good many studios, both in this country and abroad, but as a photographic establishment which does not publish work, that of Messrs. Brown, Barnes, and Bell is by far the biggest that has come under our observation. We counted a score of employés in the printing department alone, all engaged upon solar printing, and in the mounting and spotting branch, the hands were more numerous still, the former work being undertaken by men and boys, and the latter by women and girls. In the toning rooms, an average of 2,000 impressions pass into the bath daily; in the sensitizing room, from 130 to 150 sheets of paper are floated every day.

"We may not go in for the very highest class of work," said Mr. B., one of the members of the firm; "our motto is 'Go ahead;' and we do go ahead as much as we can. The London branches do their own printing and finishing, but Glasgow, Birmingham, Edinbro', Manchester, Leeds, Bradford, Wigan, Henley, Southport, Bootle, Nottingham, and Newcastle, all send their negatives to us at Liverpool.

In short, the firm's object is to cater for the million and not for the few; their ambition is to do good work of a good class and at a moderate cost. Here are the prices:—twelve cartes-de-visite, 7s. 6d., or if vignetted then only half a dozen are given for this sum. Cabinets are 15s. 6d. the half dozen, and one guinea the dozen. "Photographs to be paid for at the time of sitting," is the universal rule. On approval, the negative, together with the order, are sent to head-quarters to be dealt with.

The first proof from every plate is pasted on a sheet of paper, or printed schedule, which is filled in with the necessary particulars, and the colour of this sheet, whether yellow, blue, red, orange, &c., indicates the locality from which the photograph has been received. Obviously, it is only by adopting a most business-like system, that so vast and intricate an establishment could be organized and kept going; and when we mention that not only portraiture, but all sorts of miscellaneous work, is likewise undertaken by the enterprising Liverpool firm, it must be a good system indeed to work without a hitch.

The head-quarters office is at Bold Street. We pass by a fine collection of photographs, in which the new panel or promenade pictures are conspicuous, and walk upstairs. The firm desires that we should see something of what they propose to do in the future, before we proceed on our visiting round. *Imprimis*, there is a handsome folio volume to admire, "The Pictorial Relics of Ancient Liverpool." Fine paper and bold type are seen in conjunction with some exquisite, rare, reproductions of sketches made half a century ago and more, of Liverpool; the sketches, seventy-two in number, were collected from many portfolios, their owners placing the pictures freely at the disposal of the firm, who were thus enabled to produce the magnificent volume before us. "It's not bad for a provincial production" said Mr. B., in reply to our encomiums, and, indeed, Liverpool is fortunate in possessing such "pictorial relics." When will London have such a volume, we wonder?

Here is something else equally attractive. Milled note-paper has been popular, but people are getting tired of it, so Messrs. Brown, Barnes, and Bell propose to impart to letter writing a further charm. Here are half a dozen designs—pieces of cardboard some twenty inches high—which may be regarded as magnified sheets of note-paper. Upon each sheet is an elegant linear design in Indian-ink; there are perhaps a score of parallel lines down the page, to aid in writing straight, and at the margin are scrolls and crests, and water-lilies, &c., &c., finished also in Indian ink. These designs will be photographed, and a block prepared by the Woodburytype process, or, rather, by a modification of it, which is familiar to many of our readers under the name of photo-filigraine. With this block, note-paper will be embossed, and the result will be sheets with a delicate water-mark design and a slightly embossed surface. There is this material difference, however, between the ordinary water-mark and that imparted by Mr. Woodbury's ingenious process: in the former the markings are formed by lines uniformly transparent and of considerable thickness. The photo-filigraine process, on the other hand, not only permits the formation of very fine lines, but will reproduce half-tones as well, if these were present in the original design.

Another obvious advantage is cheapness. To make a fine design for water-marking is very costly, fifty to a hundred pounds being sometimes spent upon it; to practise photo-filigraine, you may take your design whence you choose. Whatever the camera reproduces can be adopted as a design. Our host, Mr. B., indeed, hopes soon to be able to say to photographers, "Send us an impression of any portrait negative upon the sensitive tissue we forward you, between folds of yellow paper; we will then supply you with a quire or more of note-paper, in which your portrait shall be exhibited as a water-mark." The Liverpool firm, in a word, propose to make a clever use of a clever process.

We have little time to speak, as we should, of the efforts Messrs. Brown, Barnes, and Bell are making in conjunction with Mr. Woodbury to supersede engraving on wood or steel. In Paris, as our readers are aware, the firm of Goupil et Cie. have already out-distanced all others in the success that has attended their efforts in this direction, and there are now to be seen mechanical portraits that cause us to rub our eyes, and doubt whether it is photography or a true engraving we are looking at. The Liverpool firm is a competitor in the same race, but at present their efforts are more particularly directed towards turning a draughtsman's sketch into a type-block for printing. A French publication—"La Vie Moderne"—already exists, which employs the camera to translate its sketches; but these newspaper illustrations are capable of considerable improvement. It is indispensable to have a grain throughout the picture in a process of this kind, and one of the most successful plans that has been tried in Liverpool is to make the sketch upon a paper over which a network of black lines has been traced, the veil-like markings having a close likeness to that borne by reticulated tissue. Upon this black-veiled paper an artist sketches in crayons; wherever his point touches, a black line results, covering up the network, the result being a drawing of a somewhat degraded character, since there are no high lights. To get these he employs an eraser, or the point of a knife, which scrapes away the black veil, and thus lays the white surface bare. Therefore, in the end, the picture is made up of three gradations, if we may so term them; bare white paper for the high-lights, the net-work for the middle tints, and black crayon lines, more or less close, for the shadows. Of this sketch, a photograph is taken on the Woodbury tissue, which, by washing, is made into a mould, and from this mould a plaster cast is secured. It is then a comparatively easy matter to get a type-block from the plaster cast.

At Bold Street, there may be said to be three reception rooms, one above the other, on the ground, first, and

second floor; so that, if there are many customers waiting, this circumstance is not rendered too obvious to the last comer, who might be frightened away if he saw the full extent of the *queue*. But the rooms are not only elegantly and comfortably fitted up; they are so full of interesting pictures, that half-an-hour is quickly spent within their walls. Collodion enlargements on opal, collodion transfers, and carbon prints are here in profusion—some perfectly untouched, others more or less highly finished in oil, and black-and-white, to suit all tastes and all purses. Here is a charming enlargement—two tiny sailor boys perched aloft on the truck of the main-mast among the rigging, with a clear-lit sea behind them. In the studio presently, we see the "accessory" that has here been employed, an object of a very simple character, which is placed in front of a sea background, the seat being some five feet from the ground, so as give the effect of height. Not far off is another picture of interest—the portrait of a rough gold-digger in a Californian landscape. "He came to us," said Mr. B., "with a yellow, stereoscopic picture, showing the spot where he made his fortune, and the wooden shanty in which he had lived during the making of it. 'Here's my diggings, and here am I myself; now, can't you make a portrait of me, and put me alongside the old place?" The Californian's wish was gratified, and the picture before us tells how successfully the *tour de force* was accomplished.

These are legal pictures. Here is a substantially built house, with two tumble-down cottages beside it. The owner of the house heard that his friends next door were about to pull down the adjoining premises, and build them up again on a finer scale; there was talk of a lofty establishment that bade fair to obscure the light of the house-owner, so the latter conceived the happy idea of having the old buildings photographed forthwith, as they stood, so that in case of a law dispute about "ancient lights," good evidence should be forthcoming as to the actual height of the old dwellings. Another illustration. The nose of a ship has been damaged, and while it is lying in the dry dock, a photograph is taken to record the extent of the injury. It is the result of a collision, and there will probably be a dispute as to the amount to be made good. "This is the birthplace of Gladstone in Rodney Street," said Mr. B. "An old lady living there objected to our taking the photograph; we told her Mr. Gladstone was public property, and we should do as we liked. However, she was perfectly satisfied in the end, when we presented her with a copy of the picture." There are, by the way, many fine pictures, on a large scale, of private residences, and we doubt whether there are many photographers who are so alive to the turning of an honest penny in this branch of business as Messrs. Brown, Barnes, and Bell.

We go across to the printing and mounting establishment, having first announced our coming through the telephone. Nearly a hundred people are here employed, and Mr. B. tells us the number of employés and families dependent on the firm are scarcely less than one thousand. —think of that all you who despair of getting a livelihood out of photography. Here are store-rooms for in-coming and out-going packages; here is the frame-makers' department, in which frames of all sizes are turned out by the gross, the firm's business in club enlargements being especially great. Farther on are the toning rooms; lime toning only is employed, and in washing, toning, and fixing the utensils employed are all of slate. In Mr. B.'s opinion there is not a cheaper and better material for the purpose than enamelled slate. The slabs are screwed together, and the joints made tight with white lead. The water in the baths remains clear and cool, and a utensil, two feet square, costs but twenty shillings.

The outhouses and yard devoted to printing is a very busy scene. In the open, upright screens secure shadow, but there are conveniences for printing under any conditions. You can easily tell the dry plates from the wet when they are in the frames; the former are black, the latter white. "You don't like dry negatives, Mr. Oliver, do you?" says our host; and Mr. Oliver, who has had charge of the printing arrangements for the past fifteen years, replies most emphatically that he don't.

We go upstairs, moving from room to room. Sensitizing, mounting, touching, and painting is busily going on. From the first floor we go to the second, and from the second into the roof, where the collodion enlargements are made. There is just as much bustle up here as down below. Coating, sensitizing, and stripping is going on in a series of laboratories, and close by is the enlarging room. An opening in the roof receives the small negative, under this is the lens, and a table below receives the sensitized collodion plate. No sunlight is employed, but direct rays from the sky, and, under these circumstances, an enlargement is secured in ten seconds. There is no dark slide, the room being sufficiently gloomy to prevent the film taking harm when it is carried about; the negative is adjusted and focussed, and then the sensitized opal plate is brought from the bath, and laid on the table, upon which the enlarged image falls. After an exposure of ten seconds the plate is taken up, and developed. A hundred collodion enlargements a day are sometimes made in these laboratories.

The "At Home" next week will be "M. Lafosse at Knoll's House, Manchester."

FERROUS OXALATE
BY SAMUEL FRY.

The attention called to the simplicity of ferrous oxalate for developing by Dr. Eder's formula, of solutions of oxalate of potash, and protosulphate of iron, gave a great impetus to what had, up to that time, been looked upon as a method of development rather in vogue by persons not very successful with pyrogallic. This was scarcely correct; the reason of its adoption, in spite of the difficulties, was because the resulting negatives resemble in colour wet collodion plates, and are free from the weak yellow appearance so often found in pyrogallic developing.

It may not be uninteresting to record the results of several months of daily practice with Dr. Eder's formula, and certain conclusions arrived at. First, with regard to exposure, it may, the writer thinks, be accepted that about one-fourth longer exposure is required for ferrous oxalate development than for pyrogallic. This has been the result of a great number of comparative experiments. The strong point of ferrous oxalate with those who once get well to work, is the ease with which full printing density is obtained at the one operation, and yet, curiously enough, the great cause of failure is removing the plate too soon from the solution, and thus obtaining a very thin grey image. It takes some little practice, and, I may say, determination to leave the plate in long enough. The reason will be obvious on consideration why greater density is required than in pyrogallic development. In the latter the image is of a very non-actinic colour, whilst that of the iron is, as in the collodion plate, of grey-black. The addition of an organic substance to the developer has been recommended for years past, and the writer has very carefully considered the question of sugar in the ferrous oxalate, with the result of recommending it strongly. The best proportion is one-fourth that of the iron, and may be added to the stock solution of protosulphate. It seems to assist in developing by shortening the time, and giving more intensity, as well as in preventing the oxidation of the solution which, when containing sugar, may be used for a much larger number of plates, with complete success. It has been objected that to anyone doing a large business, ferrous oxalate would be useless, on account of the slowness of its action; the very reverse is, however, the case. In my experience a photographer developing from eighty to ninety negatives daily finds he can put a

number of plates to develop in a flat dish, which requires fuller attention than when pyrogallic is used. Sometimes, when negatives are dried up, irregular semi-transparent marks are observed all over; this is merely oxalate of lime, and a wash of water containing a very few drops of hydrochloric acid after fixation, or at any time before varnishing, will remove it. Again, the well-known opalescent look over the whole plate can generally be removed by the same means.

The great advantage of this method of development is, however, to be found in the immunity from all those difficulties of yellowness, and thin, wretched negatives which so many get with pyrogallic. The chief cause of this is, that the ferrous oxalate protects the plate in the most perfect manner from actinic light during development, thus giving you the clearest possible shadows—bare glass, in fact. These are very important considerations, and not to be hastily overlooked.

It is quite true the development requires longer exposure than with pyrogallic; but the nature of the result can very speedily be judged of, and after that the slowness of the finish is an advantage, as the attention of the operator is not wanted. Lastly, a very great boon is found in the circumstance of the negatives printing so very rapidly from the clear shadows, and absence of yellowness. I strongly advise all to make themselves master of this very simple and most effective system of development.

THE PREPARATOIN OF ENCAUSTIC PHOTOGRAPHS.*

The Substitution Process.

As has already been mentioned, finer pictures are produced by means of the substitution process than by that of the dusting-on process; this is chiefly owing to the fact that in the former the collodion positive image is itself burnt-in after the silver (which in firing would turn yellow) has been replaced by some other precious metal. We have therefore in the first place to take a transparent positive on wet collodion from a negative, and to treat it with solutions of platinum or iridium chloride, until the whole of the silver has been converted into chloride and has been replaced by metallic platinum or iridium; then to dissolve out with fixing soda the silver chloride (which would burn in of a yellow colour); and finally, to fire the image on the same, or on some new support to which it is transferred.

The method adopted varies according as the picture is to be burned in on an opaque substance (as porcelain enamel, &c.), or on a transparent substance like glass; in other words, whether it is to be viewed by reflected or by transmitted light; in the latter case it must be much more vigorous than in the former. We will first describe the method for burning in photographs on porcelain and enamel.

The transparent positive is taken in a similar way to that described for the dusting-on process, but it must be developed with the ordinary iron developer; a tolerably thick and hard collodion is used. The image must be full of detail, and, viewed by transmitted light, must have a deep black in the shadows to perfectly clear glass in the high lights; it can be judged by holding it over white paper. After fixing and washing, a penknife is passed round the edge of the film to enable the latter to detach itself from the glass. It is then laid in water to which so much sulphuric acid has been added as to give it a sour taste. In this bath the collodion film becomes leathery, and looses its hold of the glass, so that by a gentle waving motion of the plate underneath the water it separates altogether, and floats on the surface of the bath. So soon as this occurs the plate is again brought underneath the floating film, and the latter lifted out into a basin of fresh water; from thence it is removed in the same way to a second basin of water, and the operation is repeated three or four times until the acid is completely washed out. In these operations a soft brush will be found to be of great assistance.

* Continued from page 413.

The toning bath is prepared in the following way:—Dissolve one gramme of platinum chloride in 100 cubic centimetres of water, and add to it a solution of bicarbonate of soda, until, when well shaken up, it turns red litmus paper a permanent blue; then add a few drops of nitric acid, until the litmus paper again turns red. This bath is kept in stock, and before using, one cubic centimetre is rinsed with 150 cubic centimetres of water. It must have an acid reaction, or a few drops of nitric acid must be added. In this solution the film is allowed to remain until the image is thoroughly blackened; then it is plunged for a short time in a solution of five grammes of fixing soda, in 100 cubic centimetres of water, and afterwards washed in three waters. It can then be transferred to the porcelain or enamel plate, and can be fixed. An iridium bath may be used instead of one of platinum. It renders the colour a dull and velvety black. A cold saturated solution of the double chloride of iridium and potassium is first prepared, and ten cubic centimetres of it mixed with 100 cubic centimetres of water. The toning is effected in exactly the same way as in the former case.

If a warmer tint is desired, the image is first toned, fixed, and washed, and then dipped in a bath of uranium, which is prepared as follows:—One gramme of red prussiate of potash is dissolved in 100 cub. cents. of water, and also 1 gramme of uranium nitrate in the same quantity of water. Before using, 2 cub. cents. of the prussiate solution, 2 cub. cents. of the uranium solution, and 1 drop of solution of chloride of gold, are mixed with 300 cub. cents. of water; the image is immersed for a short time in the mixture (not for too long, or it will become weak), and is then again well rinsed.

Transferring the film to the enamel plate, or to the object in porcelain, as well as burning in, are effected in the same way as in the dusting-on process. Care must be taken that the image is laid with its collodion side downwards on the substance on which it is to be burnt in; the image cannot, therefore, be inverted in transferring.

Transparent images on glass must, after developing and fixing, be considerably intensified, but be kept quite clear in the lights. This is effected by leaving the picture (previously well washed) for a few minutes in a solution of pyrogallic acid, and then intensifying in the ordinary way with pyrogallic acid and silver; this intensifying must be repeated ten or a dozen times. If fogging should be caused by this continued intensifying, the plate can be dipped into a bath containing a mixture of a solution of potassium cyanide with iodine water, then well rinsed, and laid a second time in pyrogallic acid. This repeated intensifying is apt to attack the film; it is therefore better to give it some kind of protection, and make it harder. The simplest way of accomplishing this object is to coat the plate with a solution of four grammes of caoutchouc in 100 cub. cents. of benzine, mixed with one cub. cent. of non-sensitive collodion, and then to dry it in a drying-box; this, of course, previously to pouring on the iodized collodion.

The picture, now sufficiently intensified, is left for several hours in the platinum bath; the shadows must be quite black, even when viewed from the glass side, before it is taken out of this bath. Only images toned with platinum have a greenish-black colour after fixing; if they are to be a deep black they must be toned first in the platinum bath, and afterwards in a solution of gold chloride. After the toning is complete, the picture is washed, passed through a solution of fixing soda or potassium cyanide, again washed, dried, and finally coated with a fatty varnish of caoutchouc. It is then submitted to the muffle furnace, in which all the organic constituents are completely destroyed.

After this, the flux, for which formulæ are given on pp. 412 and 413, is flowed over the picture, and it is again raised in the furnace to an orange-red heat.

If the picture has been toned with gold chloride only, it will appear to be gilt after fixing.

The Photographic News.

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THE STOPPING DOWN OF LENSES.

"WHY can't I use a 3A lens for 10 by 8 pictures; if I stop it well down, I get very good definition, I find, and besides, the 4A costs so very much more?" is a question that comes to us, and requires a good deal of answering. We have constantly remarked that of all weak points in a photographer's armour, his knowledge of optics is generally the weakest. Even artistic portraitists and skilful landscape photographers, albeit they produce excellent pictures, generally appear to work more by intuitive knowledge, or rule-of-thumb, than by any law of optics; they grow so accustomed to their instruments, and know so well what this can do, and that can't do, that theoretical questions rarely bother them. But it is different with those who are less occupied, and are restricted in their choice of lenses; these lack the experience of their brethren, and are, moreover, without the means of helping themselves.

It is a common belief that a lens, if well stopped down, is capable of doing the work of an instrument of larger diameter, although, perhaps, a little more slowly. But if this were the case, where would be the use of opticians making large lenses, and photographers buying them? If, for instance, as our correspondent wishes to do, it were possible to employ a 3A lens as a substitute for a 4A, there would be no object in making or buying the more expensive instrument. A 3A lens would, no doubt, cover a 10 by 8 plate in a way, but not as perfectly as the lens a size larger. If a small lens is employed to do work beyond its powers, then the instrument is strained, the perspective in the picture is destroyed, and curvature of the field, becoming very visible, causes indistinctness at the margins. These resulting defects are explained by the fact that the lens employed is too short in focus for the work it has to do.

Another point to which our correspondent refers is the expense of large lenses as compared to small ones. This is easily accounted for. The difficulties in the construction of lenses increase very rapidly with their size, and problems that are easily overcome in instruments of small diameter, grow serious when the optician comes face to face with a large lens. Indeed, in general terms, it may be said that the difficulties and cost of construction of lenses increase with the square of the diameter of the instruments.

The diameter of a lens—other things being equal—is, as everybody knows, a very good criterion of its value, and it must be borne in mind always that "stopping down" in order to get sharpness may be carried to an excess. Of late years it has become a custom, and a very good one it is, to state the working aperture of the lens in relation to its equivalent focus, and we may at once mention that $\frac{f}{40}$ is the smallest stop that should ever be used to sharpen a picture. In other words, the aperture of a lens should never be contracted beyond one-fortieth of its equivalent focus, an instrument of ten-inch focus being in no case fitted with a stop measuring less than a quarter of an inch. And the reason for this is obvious: aberration from diffraction then comes in and undoes all and more, than is gained by contracting the aperture unduly.

Even $\frac{f}{40}$ is usually considered an extreme aperture, and is rarely employed except for copying, in order to improve definition at the margins of the plate in the highest degree. So far as the other stops of modern lenses are concerned, they are usually made so that as they grow larger, the time of exposure may be decreased by one-half. Thus, starting from the largest stop of a lens, and supposing this to require an exposure of ten seconds, we may proceed as follows:—

No. 1 Stop	... ...	10 seconds
,, 2 ,,	... ...	20 ,,
,, 3 ,,	... ...	40 ,,
,, 4 ,,	... ...	80 ,,

In some cases there are stops marked X, which require half as long an exposure as the preceding larger stops.

A lens can never be thoroughly understood unless its two principal qualities are kept in mind: its working aperture and its equivalent focus. In comparing the work of different lenses regard must always be had of their qualities in this respect, otherwise all sorts of false conclusions are likely to be drawn. The ratio of aperture to equivalent focus, moreover, readily permits one to judge of the rapidity of different lenses. Thus, supposing you desire to compare two lenses for rapidity you have merely to do a simple sum with these known quantities. You take one lens first; its focal length is known to be twelve inches, and its usual working aperture, or diameter, four inches. All that is necessary, is to divide the larger by the lesser, and square the result. Twelve divided by four gives three, and the square of three is nine. Now let us take the next lens: it has a diameter of three inches, and an equivalent focus of twenty-four inches. We divide twenty-four by three, and get eight, the square of eight being sixty-four. The rapidity of the two lenses is thus found to compare as the numbers nine and sixty-four; the former, let us say, only requiring an exposure of nine seconds, while to get a picture with the latter, of the same intensity, necessitates an exposure of sixty-four seconds.

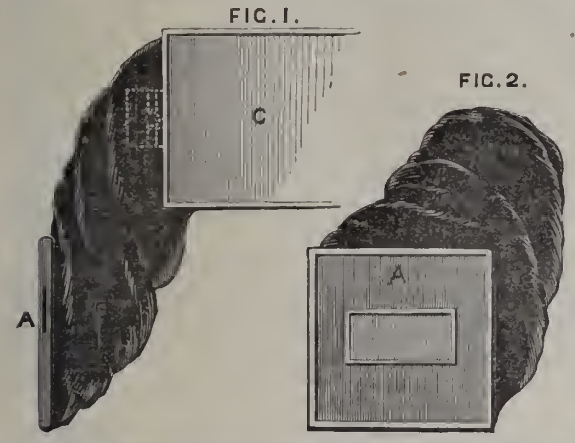
This simple means of calculating is well worth bearing in mind, although, as Dallmeyer has pointed out, it can only be applied with an accurate result to single lenses with front stops, or to double-combination lenses used with a full opening. In other cases, a rather more complicated mode of proceeding becomes necessary, since the diameter of the stop is not the measure of the actual pencil of light transmitted by the front combination. To ascertain this, says Dallmeyer, focus for a distant object, remove the focussing screen, and replace it by the collodion slide, having previously inserted a piece of cardboard in place of the prepared plate. Make a small round hole in the centre of the cardboard with a piercer, and now remove to a darkened room; apply a lighted candle close to the hole, and observe the illuminated patch visible upon the front combination; the diameter of the circle carefully measured is then the actual working aperture of the lens in question, for the particular stop employed. You have then the means at hand to make the simple calculation we have just referred to.

DR. VOGEL'S INSTANTANEOUS SHUTTER.

WE have been favoured by Dr. Vogel with a sketch of his arrangement for making short exposures, which we here reproduce. It is a very simple affair, but some of our readers who are disposed to be critical may find fault with the name we have given to it; but it must be borne in mind that the popular definition of a lobster—a red fish that walks backwards—is still a very good one, albeit the lobster is no fish, is not red, and does not walk backwards;

and so we beg leave to introduce an instantaneous shutter which is not instantaneous, and no shutter at all.

As in the case of the shutter of Captain Abney's, recently described in these columns, the Vogel arrangement has the great advantage that it need not impart vibration to the camera. A black velvet sleeve is made fast to the camera, C, or the lens, and at the end of this sleeve is a light wooden square, A, having an oblong orifice. Figs. 1



and 2 will enable the reader to understand the arrangement at once. In fig. 2 the sleeve is arranged for focussing, the orifice in A permitting one to see the object without difficulty; having focussed, the wooden square is thrown down as in fig. 1, and in this way the lens is obscured. To expose, you have merely to throw the sleeve gently over the top of the camera. As the orifice in A passes the lens, the exposure is made.

The arrangement is, as we have said, exceedingly simple; the most rapid exposure may be made, if desirable, for there are not two moments, as in uncapping and capping, but simply one sweep of the arm. The lens always remains capped so long as the sleeve hangs down. There is no mechanical action whatever, and an absence of all vibration.

Notes.

Next Friday, the 24th inst., is the date fixed for sending in pictures for the Photographic Exhibition at Pall Mall.

It may also be noted that the arrangements for the Bristol International Exhibition are well-nigh complete, and those who intend exhibiting should make known their intention to the Honorary Secretary forthwith.

In the Lake District—and the announcement may appear in most of the tourist haunts in this country, for aught we know—we frequently saw a placard in the shop windows bearing the words, "Photographs at half-price." What does it mean, we wonder? If photographers only fix the full price high enough, they may safely sell their productions half or even quarter price.

Those who find a difficulty still in retouching gelatine negatives may like to try a plan suggested by M. G. Bouillaud in the *Moniteur*. It consists in immersing the fixed and washed negative in a two per cent. solution of borax in water for five or six minutes, and afterwards allowing the film to dry without rinsing. Retouching is then as easy, we are assured, as upon a gummed surface.

Those who admire the rich tone and vigorous printing of Payne Jennings' pictures—and their number is legion—will be glad to read his note on "Printing and Toning," which we publish this week.

Mr. Payne Jennings is a fortunate man. He is to be the first to make practical trial of some new sensitive tissue which Mr. Warnerke has succeeded in preparing with gelatine-bromide emulsion. Mr. Jennings has been entrusted with a dozen sheets of the tissue, and we hear that on Mr. Warnerke's return from St. Petersburgh he hopes to be able to supply the new flexible material in rolls and lengths suitable for use in the well-known roller slide.

Mortimer Collins, in "Thoughts in my Garden," speaking of the late Rev. T. Grinfield, Rector of Shirland, Derbyshire, says:—"I recollect that one day he and I were talking of photography (an art in which I dabbled then, and like), and he aptly remarked that Virgil had furnished the best possible legend for a photographic studio:

> . . . . . "Solem quis dicere falsum
> Audeat" . . . . . .

But Virgil is not the only classic poet to furnish photographers with mottoes. Here are two quotations from Shakespeare that Mr. Robinson sends us:—

> . . . . . "The glorious sun
> Stays in his course and plays the alchymist."

And again:—

> "Shine out fair sun, till I have bought a glass,
> That I may see my shadow as I pass."

At the trial by court martial of Sergeant Marshman, a discussion recently arose on the question of an erasure on the cover of a book. It was affirmed by the defence that a name had been written and afterwards erased, and the prisoner's friend asked that the matter be referred to an expert, who, by treatment with gallic acid or other test, might discover the presence of iron and indications of ink An examination by the aid of a camera and sensitive plate, however, would have been much more searching, and more likely to lead to detection of any traces of writing, and it is a pity this fact is not more generally known. The camera has not only a quick eye for any yellow stains, such as those left behind by ink containing iron, but is also very sensitive on the subject of a surface abrasion, where the fibre of a paper has been disturbed by an eraser.

As we have before pointed out, the Bank of France has almost entirely abandoned chemical tests in favour of the camera for detecting forgeries. The sensitive plate not only proclaims forthwith the doings of the eraser or penknife, but frequently shows, under the bold figures of the forger, the sum originally borne by the cheque. So quick is the camera to detect ink marks that a carte-de-visite enclosed in a letter may to the eye appear without blemish, while a copy of it in the camera will, in all likelihood, exhibit traces of writing across the face, where it has merely been in contact with the ink.

Messrs. Day and Son, of Bournemouth, who have had considerable experience of gelatine plates during the summer, thus describe the illumination of their dark-room. "The window is composed of one thickness of ruby glass, which is coated on one side with matt varnish. This is placed outwards towards the light, the effect being a well-diffused orange-red light, a pleasure to work with, and in our (daily) experience perfectly safe. Of course there is an ordinary glass sash outside, which protects the matt surface of the ruby."

"We always," add our correspondents, "back our plates for out-door work with liquid jet, as you recently recommended. It answers splendidly."

"Amateur" thinks it should be widely known that "sugar and glycerine may be added to the oxalate developer with advantage, to render its action more vigorous, in the same way as these are employed in pyrogallic development." The circumstance is certainly well worth emphasising, although to many it presents no novelty. Messrs. Nelson have for some time past advocated the addition of sugar to their iron developer, in the proportion of one ounce of sugar to four ounces of protosulphate of iron.

A bit of advice from a practical man. "Gelatine plates give me much more detail in the high lights, and do not yield patches of opaque silver where the sun has lit up white drapery, or shone upon snowy dresses of tulle and muslin. Therefore, in summer, I say, always take with you some gelatine plates when off on a job; in winter, you can do as you like."

A smoker, smoking, appears to be a favourite model with gelatine workers, and it is certainly a ready method of testing the rapidity and general portrait qualities of an emulsion at one and the same time. Mr. Bisset Thom has just sent us two excellent studies from a "smoking carriage," and also the portrait of a panting Newfoundland dog, its dark shaggy form posed with considerable skill.

The reproduction of faded cartes-de-visite forms now-a-days a considerable item of the photographer's work, the sins of the fathers being, indeed, visited on their children. Fortunate it is for us that the camera can see so much more in the yellow images than is perceptible to the eye, and does its work in a manner that far exceeds one's expectations.

Shadows cast by the paper itself are the chief difficulties in the way of copying faded photographs. The fibre or tiny indentations over the surface cause these almost imperceptible shadows, and the stronger the light is coming from one direction, the more definite will they be. To break up the light as much as possible should, therefore, be the aim of photographers, some of whom put the picture in a sort of tray with sloping tin-foil sides, which effectually scatter the illumination over the surface of the photograph.

Reviews.

The Argentic Gelatino-Bromide Worker's Guide. By John Burgess. (*W. T. Morgan and Co.*)

It is rather difficult to notice a book of this character, since the presumption naturally is that it contains matter which ought not to be divulged by the reviewer. It contains some excellent hints regarding the fitting up of a dark room for working gelatine plates, and explains with clearness and facility the usual method of development, Mr. Burgess giving marked preference to oxalate of iron.

As to the novelties contained in the little book, there cannot be a doubt that some of them are well worthy of adoption, but it would have been better, in our opinion, if the title and contents of the volume had been written in a somewhat more subdued manner. One little point seems to require explanation. In the "new method of development," which is to effect such a startling revolution, we are told to wet the film thoroughly before dipping it through the oil into the oxalate bath, the reason for impregnating the plate with water being obviously for the purpose of repelling the oil; and yet at the end of the volume, where we find summed up the chief points to be attended to, in dealing with gelatine plates, there is this definite caution—it is, indeed, the second on the list—"Do not wet the plate before development, as it is detrimental to vigour." But this, so far as we have seen, is the only point open to serious criticism.

Handbuch der Photographischen Verfahren. Von Dr. Paul E. Liesegang. Sechste Auflage. (*Berlin*: *T. Grieben*).

Dr. Paul Liesegang sends us the sixth edition of his important work on photography, one of the most complete practical manuals published. The "Handbuch" is now a bulky volume of upwards of 500 pages, and contains 103 wood-cuts. Unfortunately, the volume is not dated on the title-page, and this, if not an oversight, would at any rate be regarded as one by many English readers. The manual, however, contains details as to the preparation of gelatine emulsion and its development, so that the sixth edition has obviously been written up to date. For general photographic work, Dr. Liesegang's volume would prove eminently valuable.

Topics of the Day.

PRINTING AND TONING.

BY PAYNE JENNINGS.

I, for one, do not believe in any formula giving a weak sensitizing bath. The paper dealers, I know, frequently send out printed instructions which you are asked implicitly to follow, and give you a silver bath as low as 30 grains to the ounce. I have, however, never been able to work this successfully, and generally find 50 grains to be the minimum strength compatible with good results. In the sensitizing dish it will be well to have a glass rod attached to one end, and each sheet of paper should be pulled over this after sensitising; it may then be blotted off on stout blotting-paper, and hung up to dry. I think it is much better not to have the paper bone dry when placed in the frames, especially in summer time. Before placing the paper on the negative it should be carefully wiped with a piece of clean linen or silk, as the fluff from the blotting-paper adheres slightly to the surface. There can be no doubt that shade printing in all cases is the most economical (except of course, in the very exceptional case of a hard negative), there being much less likelihood of your amassing a large quantity of defective prints. The general depth of your batch of prints must depend entirely upon the state in which you keep your sensitizing and toning bath. The intelligent printer

knows well that it is here that he must give his best attention if he desires uniformity in his daily results. Let the printing bath be always of uniform strength and the due proportion of acetate of soda and gold in the toning bath and you will rarely, if ever, get into trouble. You know at once what reduction will take place in your print, just as though you saw it finished and dry before you; but let irregularity creep into the formula, and your day's work will certainly be more or less a failure. The rules regulating the sensitizing and toning baths must be rigidly observed, and to carelessness in this respect may be attributed the majority of printing failures and general want of uniformity in results. To keep the silver bath in workable strength, a stock solution of silver, eighty grains to the ounce of water, should be kept in readiness to the hand of the sensitizer, and one ounce of this solution added to every five sheets sensitized, care being taken to agitate the dish so as to equalize the strength of the solution.

Toning.—For toning the print I believe the ordinary acetate bath is the best, giving, as it does, such beautiful warm tones, and which I myself am partial to. When the prints are taken from the printing-frame they should be well washed in three or four changes of water, and lastly in water containing a handful of salt.

Toning Bath.

Chloride of gold	1 grain
Acetate of soda	35 grains
Carbonate of soda	5 ,,
Water	8 ounce

A convenient form of stock solution to add to the toning bath (as it loses energy) is as follows:—

Chloride of gold	15 grains
Acetate of soda	2 drachms
Water	1 ounce.

A portion of the solution, regulated by the daily average of sheets of paper toned, should be added to the bath after the day's toning is done; it will then be in good condition for the next use. It will however, always be found wise to have two or three baths in use, and work them alternately.

The prints when taken from the toning bath should be again placed in water containing a little salt and afterwards well and carefully washed in several changes of water.

Fixing.—For fixing I believe a strong hyposulphite bath is the best, not less than four ounces to the pint of water, care being taken to neuteralize with carbonate of soda or ammonia. For washing, the best plan in my opinion is to wash a comparatively short time and have a boy constantly turning the prints over during that period, first turning them all face up, and then going through the whole batch again and turning them in a contrary direction, and so on.

The "Topic" for next week will be, "On Lighting the Model," by Lydell Sawyer.

FRENCH CORRESPONDENCE.

New Method of Tinting Photographs—New Method for Accuracy in Determining the Length of Exposure—New Edition of M. Vidal's Work on Calculating the Length of Exposure—Instantaneous Shutters for Photography Out of Doors.

New Method of Tinting Photographs.—M. Kurtz has just taken out a patent for a process for colouring photographic prints, a process which might be styled printing in powdered colours. I do not know how far this plan of applying flat tints to drawings or photographic impressions may be successful in practice, but I confess I have grave doubts on the subject, more especially when it is a question of depositing on a photographic surface a number of different colours. Of course, any process may be patented, and there is, consequently, no reason for being astonished at a manufacturer having devised the plan I am now about to describe, however strange it may appear at first sight. A box, surmounted by a bellows, admits at its upper side the print which is to be coloured. The bellows, by means of a bent tube, directs the air into a hopper containing the powdered colouring material at the bottom of the box. When the bellows is put into action, the current of air produced blows up the powder from the bottom of the hopper, where it lies in a heap; the heavier particles immediately fall back again, while the lighter ones float in the form of an impalpable dust in the interior of the box, and cause in the upper portion of it a sort of mist, which is only slowly deposited. At this moment the print to be coloured is introduced by a side opening, and of course must be kept quite flat. The powder, in subsiding, deposits a more or less light tint on the parts of the print not protected by paper shades or screens cut out to the outlines of the picture. So soon as one tint is fixed the shades are changed; the first powder employed is removed from the apparatus, and one of another colour is substituted. The bellows is then again made to act, the print is again inserted, and so on until all the tints which it is desired should be used have been deposited. According to M. Kurtz, by no other method can perfectly flat tints be so quickly and easily laid on a print or drawing; they can also be fixed with ease by any of the known fixing processes. What, however, is a great stumbling block with me in accepting this process at the high value which the inventor places on it, is my inability to credit the opinion he expresses. I cannot believe that it is so easy as he says to remove completely from the box all the particles of one powder before introducing another; it may be possible, but it must necessarily take a long time. How, again, does he arrive at measuring the degree of intensity of a colour, whose transparency, of course, varies with the quantity or thickness of the powder deposited? It may be that I exaggerate also the difficulty of cutting out and fitting the paper screens so as exactly to cover the part which it is intended to protect, and to prevent the powder from penetrating into the region of another colour. But I repeat, before expressing a definite opinion, it will be necessary to see the process in action, and if I have laid more stress than is necessary on the doubts that I feel, it is because this method may contain the germ of an invention to produce the same effect in a more certain and scientific way.

The Necessity for Estimating with Accuracy the Length of Exposure.—The further we advance with the employment of highly sensitive films, as are those of gelatino-bromide of silver, the more it becomes necessary to possess a means of judging the length of exposure required with sufficiently approximate accuracy. More especially is this necessary when working in the open air, or we run the risk of returning to the developing room with a number of plates either over or under-exposed. During the holidays, which I have been passing in the South of France, I have experimented with a number of gelatine plates coming from various sources, and I have felt the utter impossibility of getting any good result without being able to fix the length of exposure, depending as it does on so many different factors—the luminous intensity, the focal distance, the diameter of the diaphragm aperture, and, above all, the sensitiveness of the plate. There is room for guessing when it is a question of minutes, but none at all when the exposure may not extend beyond one, two, or at most, three seconds. It must not be forgotten how liable we are to prolong the exposure to twice or even three times as much as is necessary. Then when the result is a failure, we lay the blame on the plates or on the developer, but never on our own inaccuracy. What is still worse is that this want of success leads to discouragement, and we are tempted to kick photography over altogether. Now, it is so easy to provide oneself with a means of measuring the time of exposure that I cannot understand why so few photographers take advantage of it. Can there be any

reason for people actually refusing to adopt this elementary precaution which would save them so much doubt and disappointment? For my own part, I shall never cease recommending all photographers to work less at haphazard.

New Edition of M. Vidal's Tables for Calculating the Length of Exposure.—In face of their requirement, now-a-days more necessary than ever, I am passing again through the press my tables for calculating the time of exposure, the former edition of which is now exhausted. The second edition will be shortly published by Gauthier-Villars. All that has been necessary in correcting the tables for the press has been to write seconds for minutes, and the calculation remains absolutely the same. I have added a method to be adopted for estimating fractions of a second in hundredths and thousandths.

Instantaneous Shutters for Use in Out-of-door Photography.—Of all the instantaneous shutters which I have seen described, the great majority can only be used for photographic operations within the studio. They are mostly complicated by their depending on an electric apparatus, which renders them useless for tourists, whose luggage must necessarily be compressed within the smallest weight and dimensions. In my opinion, the only shutter which can be used with advantage in open-air work is one which is dropped by weights or springs. By this means I believe we can obtain quite sufficient rapidity, and an exposure capable of being estimated. The shutter which I am now having made has been devised to realise these objects, and to enable us to ascertain the duration of the exposure in fractions of a second. I hope it will be found to succeed in practice. Above all things it is necessary to facilitate the work, and to lighten the baggage of the tourist photographer, as well as to simplify the apparatus which he carries with him. Leon Vidal.

ON THE REVERSAL OF THE DEVELOPED PHOTOGRAPHIC IMAGE.

BY CAPTAIN ABNEY, R.E., F.R.S.*

If a plate be exposed in benzene, however (a liquid which does not permeate through gelatine), the phenomena are still existent. If a plate be exposed to such an extent that there is a marked image apparent before development, and be then immersed in water, it will be found that when the image appears the gelatine refuses to swell to the same extent that it does when the light has not acted. Taking these two experiments together, it is evident that the gelatine has played some part with the silver bromide. It may, therefore, be presumed that the three last phenomena are due, the first to the oxidation of the surface-particles of the bromide and a consequent change in colour; the second to the change in colour of these particles, permitting the coloured rays to which it is sensitive to strike a deeper layer; and the third to the oxidation of this layer at the expense of the gelatine. The third and fourth phenomena are so unimportant that they are scarcely worth investigating. The presence of organic matter is evidently necessary for their appearance; at least, I have never been able to obtain them with collodion films not containing a preservative.

As before, the experiment of saturating one of these gelatine films with bichromate of potash shows that the reversing action is very much increased by the presence of the oxidizing agent. Mr. Bolas has recently described a plan of producing reversed negatives by allowing the bichromate to dry in the film, which is a practical application of this reversing action of light in the presence of an oxidizing agent.

A convenient method of showing these phenomena on the same plate is to use a screen containing squares of graduated opacity, as suggested by the Editor of the Photographic News,† or such as the sensitometer prepared by Mr. Warnerke, and procurable at most photographic warehouses.

Having treated of these reversals of the image in a general way, it now remains to show which radiations are effective in producing them. For testing this, spectro-photography was resorted to, a special dark slide having been constructed capable of holding a cell which would contain the plate, and be immersed in a liquid or any gas or vapour whose action it might be desired to test. Three flint-glass prisms were used, and a lens to the camera of about 2 feet equivalent focus, the collimating lens being a duplicate of it. The time of exposure was, as a rule, three minutes to the sunlight or to that of the electric arc, care being taken in the latter case that an image of the positive pole fell on the slit so as to give a continuous spectrum. The action of potassium iodide on silver iodide will first be described.

A plate was exposed after being sensitized, and after washing was immersed in a cell containing a 1 per cent. solution of potassium iodide and exposed to the spectrum. The result is shown in fig. 1, the same rays which cause an image to be formed in the usual manner likewise caused a reversal (dotted curve fig. 1.

A plate similarly prepared was exposed in a 1 per cent. solution of potassium bromide for the same length of time, with the result that a reversal was obtained in the blue and likewise in the red, but much less marked in the latter (fig. 2). These two experiments tend to prove that, in reality, it is the bromide that is acted upon to some extent, and the effect is not entirely due to the silver-salt. This was particularly manifest in the case of the iodide and bromide slightly acidified with a mineral acid, and was much less marked when the solution was alkaline—in the latter case, the reversal taking place in the blue, and not in the red regions of the spectrum.

To see if the silver salt had any marked effect on the rapidity of oxidation, a silver-iodide plate was washed, given the same preliminary exposure, and then placed in the spectro-photographic apparatus without any surrounding fluid. A reversal was obtained in the blue, but not to any thing like such an extent as when placed in soluble iodides or bromides. The reversal, therefore, when the plate is exposed in the latter is partially due to the action of radiation on the bromide, and partly to that exerted on the silver-salt itself.

A silver iodide plate, treated as before, was next exposed in a weak solution of potassium bichromate, when there was a strong reversal in the red (fig. 3), and no action whatever in the blue.

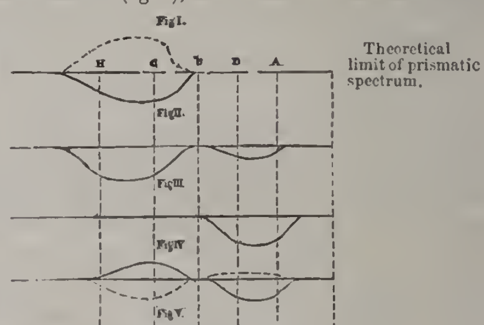


Plate showing reversing actions of Iodides, Bromides, and oxidizing agents on AgI.

N.B.—The curves below the line show the reversals or positive images; the curves above the line show the ordinary action, or negative images; the ordinates approximately represent the amount of action.

Permanganate of potash was next substituted for the bichromate, and the same reversing action was found, with the addition of a negative image in the blue (fig. 4).

With hydroxyl the same phenomena were observed as with the permanganate, the reversal taking place a little further into the green (fig. 5). Studying the absorption due to these three oxidising agents, it would appear that the reversing action is due to the action of light on the salt of silver, which is changed by the preliminary exposure to light, and not to the action of light on the medium in which the plates are placed.

With mineral acids a reveasal was always obtained in the red and in the blue, a portion of the spectrum in the green and yellow remaining unreversed (fig. 6). Now the action of these acids is not a strictly oxidizing action, but is probably a removal of the loose atoms of the silver which goes to form the subiodide

* Continued from p. 436.

† See our "Note," p. 355 of present volume.—Ed. P. N.

and leaving silver iodide behind as the result of the action. The results of the action of acids do not, therefore, vitiate the above deduction. A plate exposed in benzene or in nitrite of potash showed no reversal even with a very prolonged exposure. It should be remarked that the action of permanganate and bichromate of potash when very feeble is sometimes to give feeble negative images in the red and blue in lieu of positive images; also positive images in the blue, and feeble negative images in red see dotted curves in figs. 4 and 5. But this is to be accounted for by the fact that the dilution of these oxidising agents is so extreme that the reducing action on the unaltered sensitive salt is far greater than the rapidity of the oxidation*.

Ordinary bromide of silver in collodion or gelatine may be taken as giving almost identical results under the influence of a soluble bromide†. Now ordinary bromide is sensitive as far as B (see dotted curve, Pl.VI. fig. 7); and it might be presumed that this sensitiveness to the rays of lower refrangiblity would cause a modification in the action of the soluble bromide. A reference to figures 7 and 8 will show that this is the case, but that at the time the features which are so marked with the action of bromide on silver iodide are present. Fig. 7 is the curves due to silver bromide in collodion which had received a preliminary exposure and was then exposed in a 5-per-cent. solution of acid potassium bromide. It will be seen that the curves in figures 7 and 2 are similar, showing that the principal action is due to light acting on the soluble bromide in the presence of an acid. Fig. 8 is a similar plate exposed in an

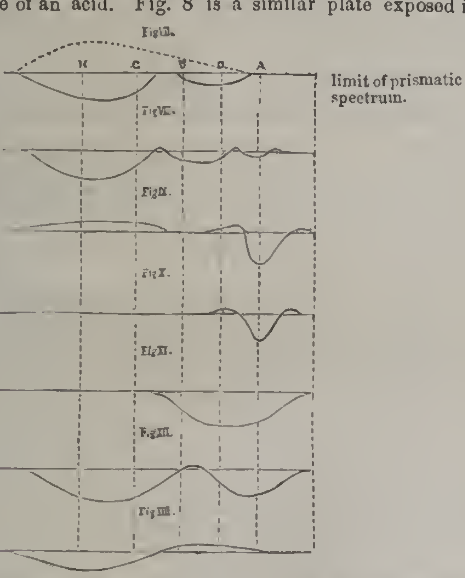


Plate showing reversing action of Bromides and oxidizing agents on AgBr.

N.B.—The curves below the line show the reversals or positive images; the curves above the line show the ordinary action, or negative images; the ordinates approximately represent the amount of action.

alkaline solution of KBr, in which there is a modification of the curve. The last loop is probably due to the silver sub-bromide itself, since the oxidation of this salt by oxidizing agents occupies approximately the same position (see fig. 10).

Fig. 9 shows the effect of permanganate of potash; and when it is compared with fig. 10, which is the curve due to oxidation by bichromate of potash, it will be manifest that the chief oxidizing action lies in the red and ultra red of the spectrum.

Fig. 11 also shows the effect of bichromate of potash on silver bromide given a preliminary exposure, the plate in this case being a gelatine plate. It will be seen that the bichromate totally arrests all action in the blue, whilst it rapidly causes a reversal in the red.

Fig. 12 shows the effect of mineral acid on silver bromide, by which it will be seen that a maximum of reversal takes place in the red and in the blue. As before stated, in regard to the iodide, the action of these acids can scarcely be regarded as an action of oxidation.

Fig. 13 shows the phenomena due to over-exposure of silver bromide, by which it will be seen that reversal takes place in the blue, and not in the red. Comparing this with figs. 7, 11, and 12, the effect of extraneous matter in causing a reversal is very marked.

Collodion plates exposed in benzene, or in aqueous solutions of pyrogallic acid, potassium nitrite, and sodium sulphite gave no reversal whatever.

Gelatine plates exposed in benzene gave the phenomena shown in fig. 13, whilst with the other media no reversal at all was obtained.

The explanation of the apparent contradiction shown by the behaviour of a gelatine plate exposed in benzene has already been given.

The actions of many other liquids and gases* have likewise been tried; but it was thought that the examples given sufficed, since they all pointed to the same conclusion, which may be summarized as follows:—

1st. The reversal of an image is due, in the majority of cases to the oxidation of the subsalt of silver which formed by the first impact of light on the exposed salt of silver.

2nd. The oxidation is due to the action of light, the rays of lower refrangibility being the most powerful accelerators of oxidation.

3rd. Reversal of an image may be due to the presence of any haloid of an alkali, the reversal in this case being partly due to the action of light on such a haloid, and partly due to the tendency to oxidation of the subsalt of silver.

4th. the presence of a mineral acid tends powerfully to cause a reversal.

Correspondence.

HYPOSULPHITE WASHINGS.

Sir,—Knowing very little of the purely commercial aspect of photography, I yet read with much surprise your article under the above heading, in which you say that there are many who do nothing with their hyposulphite washings. If this be really the case, and if, on the other hand, they save their print washings, it is one of the most singular exemplifications of "saving at the tap and wasting at the bung hole" that can be imagined. for now just let us see for a moment how the matter really stands. In the first place, the print washings consist of a certain quantity of free nitrate of silver, small in a single picture, but large in the aggregate which, being decomposed by a chloride, yields argentic chloride which consists (roughly speaking) of three parts out of four of silver. The hyposulphite washings, on the other hand, precipitated by a sulphide, contain nearly $\frac{7}{8}$ths of metal or to be quite exact 108 parts of silver to 16 of sulphur. Now let us think for a moment on the source whence this is derived. In working at a negative, what proportion of the original coating of the plate is utilized in forming the picture. I think we may safely say that this does not exceed one-fourth; therefore, if this be correct three-fourths are contained in the hyposulphite bath; and again in fixing the pictures a very large amount of the silver used in sensitizing is recoverable from the bath.

As to the trouble or annoyance in saving the silver it seems to me reducable to a miminum. By pouring all hyposulphite washings into a cask, or jar, with a wooden spigot one-fourth from the bottom, and precipitating once a week by the addition of sulphide of potassium, the clear liquid could be drawn off and thrown away till at length a veritable silver mine would have collected at the bottom, and amply repay the trouble incurred in its collection.

Pardon me if I venture to object to your use of the vague term "liver of sulphur." The precipitant is really the sulphide of potassium. The term liver of sulphur applies to

* There is one singular fact to be noted in this, and which I propose to treat of in another contribution, viz. that the iodide of silver, when given a preliminary exposure, is sensitive in a region of the spectrum lying between a point near D and one near A. This phenomenon has been described before and not explained, though experiments show that the explanation is easy.

† As before explained, it is useless to expose such plates in a solution of soluble iodide, since silver iodide is immediately formed.

* Ozone was most marked in its oxidising properties, and gave a curve very similar to fig. 12, both with the iodide and bromide of silver.

a substance formerly used in medicine, and is formed by heating together carbonate of potass and sulphur, by which process a preparation is obtained, the greater part of which is not only inert in the precipitation of silver, but would also encumber the precipitate by a large quantity of useless material,—I am sir, yours &c., Photo. Chemicus.

ROYAL CORNWALL POLYTECHNIC EXHIBITION.

Sir,—In last week's notice of this Exhibition I am credited with two exhibits. I only sent one, viz., "The Elephant Jumbo, and his keeper Scott."—Yours truly,

A. Bisset Thom.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN EXHIBITION, 1880.

Dear Sir,—Kindly allow me to notify to intending exhibitors at the forthcoming Exhibition that Friday next, September 24th, is the day appointed to receive exhibits. Those, in cases, to be addressed to Mr. Bourlet, 17, Nassau Street, Middlesex Hospital, London; and those by hand to be delivered at the Gallery, 5, Pall Mall East, up to nine o'clock at night. Any further information I will send upon application.—Yours faithfully,

Edwin Cocking, *Assistant Secretary.*

57, *Queen's Road, Peckham.*

Talk in the Studio.

The Photographic Exhibition.—The Exhibition will remain open daily (Sundays excepted) from Monday, the 4th of October, until Saturday, the 13th of November. Admission (from 10 a.m. till dusk), one shilling. It will also be open every Monday and Saturday evening. Admission (from 7 to 10 p.m.), sixpence. All packing cases must be sent (carriage paid), addressed to the Photographic Society of Great Britain, care of Mr. James Bourlet, 17, Nassau Street, Middlesex Hospital, London, so as to arrive not later than Friday, September 24th. Pictures by hand will be received at the Gallery, 5a, Pall Mall East, on Friday, September 24th, until 9 p.m. No packing cases can be received at the Gallery. Each exhibitor must send a letter of advice (containing a description of each picture, as also a statement of process, and any further detail, to be inserted in the catalogue), addressed to the Hon. Secretary, Photographic Society of Great Britain, 5a. Pall Mall East, London S.W. Each frame or picture may have the exhibitor's name and subject neatly inscribed, but no address, or anything in the shape of an advertisement will be permitted.

Alarming Fire at a Studio.—Last week a serious fire occurred at Newark, at the studio of Mr. McLeod, The premises are situate near the bridge over the Devon to the Midland Station, and opposite to the Castle. The building was built of wood, and the chemicals used for photographic purposes helped materially to increase the inflammable nature of the structure. In a short time after the discovery of the fire the whole building was wrapt in a sheet of flame, and the red glare in the sky could be discerned for some distance. The castle was illuminated, and the faces of the people in the crowd looked weird by the light of the burning building. The fire brigade was on the spot as quickly as possible, but owing to the men living in all parts of the town, they could not be collected as quickly as could be wished. They were not long, however, before they were on the scene. The fire had spread so rapidly that it was almost useless for them to try to save any part of the premises. The roof fell in with a crash, and the sparks flew up in millions, giving a very dazzling effect. Much sympathy was manifested for Mr. McLeod, and it certainly is a most unfortunate occurrence for him that his studio should have been burnt down just as the fine weather, so necessary for good photography, set in.

Action of Potassium Iodide on Hydrogen Peroxide. By E. Schone.—The separation of the small quantity of free iodine, which occurs on mixing pure hydrogen peroxide with neutral potassium iodide, is not due, as stated by Berthelot (*Compt. rend.* 90,333), to the action of the carbonic acid in the air, or to some constituent of the containing vessel, but to the fact that hydrogen peroxide is decomposed by potassium iodide into water and oxygen, a small quantity of free iodine and free alkali being liberated at the same time.—*Journal Chem. Soc.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, "*Photographic News*" *Office*, 5, *Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed* "*Union Bank, Photographic News Account.*"

*** We regret exceedingly that for reasons beyond our control many important advertisements, notably those of Messrs. Wratten and Wainwright, Messrs. Watson and Son, &c., were perforce omitted in our issue of last week.

Wanted a Word.—Mr. H. E. Palmer suggests that the word "model" should be henceforth employed in place of "sitter," backing his proposal by the fact that Johnson used the word in tho very sense. Mr. Palmer, however, humourously observes that perhaps "sitters" themselves might supply a very different word if called upon. He can fancy Mrs. Brown, for instance, having a decided opinion of her own on the subject, after passing a warm day in the studio. "What with the hot weather, with the gromiter up to 90 'grees, as the sayin' is, with a heat enough to toast a bloater, leave alone a person as is considered *corporal*, like myself, and then the different persishens, a putting my 'cad this way and then that way, why, sir, I can't find out a word too bad, unless its 'victims'; that is the word, and no other, as I can see, that the gentleman is in search of."

Puzzled.—We attribute the defect to imperfect fixation; the hyposulphite was scarcely strong enough, or was exhausted before these particular prints were immersed. We think you will find this to be the cause.

J. P.—Houghton and Co., or Werge, whose names you will find in our advertising columns, could supply you. The operation of development can be watched behind ruby glass, but not very perfectly.

W. Orchard.—We should think so, but could hardly say for certain unless we saw the paper. Try the experiment yourself; expose a plate near your window for two or three minutes, and then see if it develops clearly, without any trace of fog. If this is the case, you may put your trust in the light.

H. Page.—We are sorry your note was overlooked; Allon Street, Islington, N., will find him, if at all.

B. B.—1. Not in the way you mention. 2. Unfortunately the four-in-hand coaches have ceased running for the season on most of the London roads; at the same time there should be still ways of taking a picture. The photograph, to turn out a good one would require much attention to detail and surroundings.

A Poor Photographer.—1. Hardwich's advice in the matter is to make a solution of citric acid, sixteen grains to the ounce of water, and to drop this into the bath in the proportion of a fluid drachm for each eight ounce, of the silver solution. Immerse a strip of the blue litmus, which immediately reddens, and then add, drop by drop, some liquor ammonia, until, after vigorous stirring, the litmus paper again becomes blue, and remains so. Filter, and give the liquid a slightly acid reaction by the addition of dilute nitric acid; finally make up the bath to the strength you want to use it, by adding nitrate of silver. 2. We cannot advise you with certainty. We should have added a little ammonia when we saw the grease spots so-called; but we cannot help thinking that it is the hot weather more than anything else that caused your difficulty. We will take care to return your shutter if you will send it.

Sampson.—1. You should have dipped the *back* of the sheet in the citric acid after sensitizing. 2. Simply pour water upon it, as it stands in the bottle; this will put an end to the red fumes, but the cotton must be thoroughly dried again before being dissolved.

Madras.—They will keep well enough, if stored perfectly dry. We should recommend development only at night time when the temperature is low, unless you have means at hand of cooling your laboratory. Gelatine will certainly run at 90° F.

John Stone.—It is usually preferred because it is lighter and less breakable, and, moreover, is not likely to harm the film by its white reflections. Still, we frequently employ a white dish, which has the advantage you mention.

Mezzotint.—1. The easiest way to produce invisible photographs is to print upon ordinary silver paper, and then to bleach the picture with bichloride of mercury solution: a bit of thick blotting-paper, which has been steeped in hyposulphite and dried, serves to bring out the image again. The two are put face to face, and placed in a saucer of water. 2. Any transparent varnish applied to glass would produce the effect you mention.

T. Gordon.—Very likely; but we cannot say without testing. Nitrate of silver should make a perfectly clear solution.

T. Wainwright.—If it acidifies litmus paper quickly, reject it.

W. L.—Thank you, but we would rather not.

Tramp.—You must have your foliage perfectly still; unless you do this, the subject will never make a good picture.

The Photographic News, September 24, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Hyposulphite in the Cardboard—Edwards' Intensifier—High and Low Studios—Photo-zincography for Illustrating Catalogues.

Hyposulphite in the Cardboard.—It is one of many hitherto-recognized facts that pictures which have kept excellently for years in an unmounted condition often quickly turn yellow if they are pasted on cardboard. Specimens of cardboard have been examined by extracting them with hot water, and the presence of hyposulphite has been inferred, as the aqueous extract decolourised blue iodide of starch. The presence of hyposulphite in cardboard can easily be explained, as it is used in the paper manufactory as an "antichlor," to combine with the last traces of chlorine which remain behind in the paper after the bleaching process. A chemical substance, sulphite of soda (Na_2SO_3), has lately been used for this purpose instead of hyposulphite ($Na_2S_2O_3$), because the former is said never to act disadvantageously on photographs. It appears, however, that the disadvantageous action of the hyposulphite on the cardboard is yet an open question. Dr. Vogel has communicated to us that he obtained a large sheet of cardboard from a photographer which should have occasioned the fading of pictures pasted on it. He mounted a row of photographs on this piece of cardboard, and these kept perfectly, without any trace of fading. Yet, further, he took a piece of pure cardboard, and laid it for two hours in a five-grain solution of hyposulphite, and dried it; photographs mounted on this cardboard have kept perfectly, without showing a trace of fading. In any case, impurities of the starch paste act much more disadvantageously on the pictures than impurities of the cardboard.

Edwards' Intensifier.—Edwards' intensifier, prepared by mixing bichloride of mercury, iodide of potassium, and hyposulphite, has obtained recognition on all sides by dry-plate men; but we are still in darkness as to its mode of action. It is known that the mixture of iodide of potassium and chloride of mercury made according to Edwards' method forms a precipitate of iodide of mercury, which is dissolved again by an excess of iodide of potassium. But the quantity of iodide of potassium recommended by Edwards is not sufficient for the solution of the precipitate; it is, however, immediately dissolved on the addition of hyposulphite. A double salt of hyposulphite of potassium and mercury is by this means formed, as Rammelsberg has described it:

$$3Hg\ I_2 + 8Na\ S_2\ O_3' = 6Na\ I + \begin{cases}3Hg\ S_2\ O_3 \\ 5K_2\ S_2\ O_3.\end{cases}$$

The gradual decomposition of this double salt by the separation of metallic sulphide is well known, and it is not to be wondered at, therefore, that the durability of the Edwards intensifier is of a somewhat limited character. There is gradually formed a blackish-brown precipitate, even in the dark room, and this naturally detracts something from the action of the intensifier. It has been said that in employing Edwards' intensifier, sulphide of mercury is formed; but this can hardly be; the intensifier acts precisely as if there was no hyposulphite present. This is apparent if one half of a plate is treated with Edwards' intensifier, and the other with a solution of iodide of mercury in iodide of potassium, such as is obtained by dissolving five parts of chloride of mercury in fifty parts of water, and adding thereto five parts of iodide of potassium. Both halves of the image will be found to be evenly intensified. If, however, the plate, after intensifying, is dipped in a concentrated solution of hyposulphite, then both halves are in like manner equally weakened, the subiodide of mercury ($Hg_2\ I_2$) which has brought about the intensification being decomposed by the hyposulphite. If sulphide had been formed in the intensifying process, the hyposulphite would have no action, since sulphide of mercury is not decomposed by hyposulphite.

High and Low Studios.—A good deal of discussion has lately taken place abroad, on the subject of high and low-roofed studios, and as to which are best for portrait making. It seems the general opinion among German photographers, and those of Berlin particularly, that a low glass-house (ten to twelve feet high) is better than a lofty one. Portraits require contrast and a vigorous lighting of the head, with the lower portions of the body in a subdued light, and this result, it is argued, is obtained more easily in a low studio than in a high one, which has diffused light throughout. A Berlin photographer, who recently built an atelier on the model of the renowned studio of Loescher and Petsch, was so convinced that the roof was not high enough, that he spent £150 in heightening it; but after two years he came to the conclusion that he had made a mistake. Not deterred by this example, another gentleman in the Parisian capital has built a studio thirty feet high, in the hope that he might thereby improve the modelling of his pictures; but he has found the experiment answer so badly, that he has now resolved to raise the flooring ten feet, and to revert to the old order of things. It is only, *bien entendu*, portraiture that is here under discussion. For other photographic work, reproduction, &c., a lofty studio has, of course, advantages over a low one.

Photo-Zincography for Illustrating Catalogues.—It is well known that the illustrated "Notes" of our Royal Academy and of the Paris Salon contain a large number of prints reproduced from sketches contributed by different painters. These sketches are reproduced for the most part by means of photography, or a kind of photo-zincography. The pictures are photographed, a photo-litho-transfer obtained in fatty ink, which is placed upon a zinc plate, and the plate subsequently etched. Pen and ink originals give the best results, as might be anticipated, for the jet black lines are so well rendered by photography. In London there are several establishments where the process is carried out, but Paris, Berlin, and other Continental cities seem to have more demand for this class of work, and hence larger copying establishments of this character are to be found abroad.

At Home.

M. LAFOSSE AT KNOLL'S HOUSE, MANCHESTER

Delightfully situated in its own grounds at Higher Broughton, above the vapours of murky Manchester, is a quaintly built villa of black oak, a bit of mediæval architecture that seems to have been forgotten by the modern builders, who have been so busy planting their bricks and stucco around. It is Knoll's House, and, posed on its terrace-like pedestal, it appears all the brighter and more pleasing by reason of its contrast to the solemn square edifices in the neighbourhood. The gable roof and shining black beams are charmingly picturesque, and as the building lies back at some distance from the road, there are quietude and repose to still further enhance its being.

The interior is no less pleasing. An oak passage, somewhat low and sombre, with shining casques of steel and polished breast-plates on either side, leads to a panelled room in which there is much exquisite carving. Here everything is in good taste and keeping with the structure. The furniture is all of black oak, and on the massive sideboard are tankards and platters of burnished silver. The fireplace is of mediæval design, and the settees and curtains have an air of the tapestry age about them. To be brief, in the construction of Knoll's House, every bit of Old Manchester that could be collected together by its builder was made use of, and the experiment, a risky one, has yielded a very happy result. It is only the oak room and

hall, however, that possess an old-fashioned air. The rest of the rooms have lofty ceilings and modern furniture, although in the handsome gallery or reception room there are also much antique work and rare carving to admire.

M. Lafosse has a business establishment in the town of Manchester itself, and it is only the higher class camera work that is executed at Knoll's House. M. Lafosse's name stands so high as an artist that we need not speak here of the merits of his pictures; he executes large numbers of cabinets, for which he possesses a wide reputation, while in respect to club portraits on opal—to take another branch of work—they are produced upon so large a scale that M. Lafosse actually employs a staff of framers on the premises.

A courtyard separates the house from the working departments, the studios being again connected by a passage with the front entrance. We cross the yard, and M. Lafosse points out where his large groups are taken. There are a rustic bench and two or three chairs upon a platform, the boarded background being painted of a greyish tone, and trained with imitation ivy. "After two o'clock I can do anything I please there; I know my effects as well as in the studio indoors." We pass on into the framing room. "Here are the cheap club portraits we were talking about just now; our charge, finished in colours, is thirty-five shillings, or two guineas in black and white." The pictures are all upon opal, the latter being simply albumenized, coated with collodion, and sensitized in the ordinary way. In reply to a question as to toning, M. Lafosse says: "The tint is so satisfactory after development that we never tone."

We enter the printing room. It is a model of construction and ingenuity. It is an oblong apartment, and, as a matter of course, not very light. Along the length of the room runs a dresser or bench, upon which the pressure-frames are stood for changing. In front of the printers are large roof-like windows, and the frames, put upon a sliding tray, may be either pushed forward under these windows, or farther still into the open air for printing. There are six of these sliding trays, measuring some five feet broad, all of which in turn are drawn in upon the dresser, to change the frames; and according as the tray is pushed out again into the light much or little, so the printing proceeds quickly or slowly. Conveniently situated behind the printers is the darker sensitizing room, whence fresh supplies of paper are drawn, and also the negative store room, so that the employés have all necessary to their work conveniently to hand, and the operations proceed smoothly and uninterruptedly. The negative room has racks for 14,000 negatives, each pigeon-hole containing ten plates; hence the numbering is at once plain and straightforward. M. Lafosse is never troubled with rising of the film; he employs both Hubbard's and the Autotype varnish.

There are two fine glass rooms at Knoll's House, at right angles to one another. Our kindly host insists upon taking a portrait, so we sit down. When the picture is taken, however, we scarcely know, for there is such a humorous rattle the whole time, and all sorts of conjuring going on with a fan, and anecdotes about past sitters and present ones, that by the time we begin to compose ourselves, he says it is all over. M. Lafosse is of opinion that French photographers are certainly not ahead of those in England now-a-days. "But Paris photographers have many advantages—this is a nice little fan, is'nt it?—you see their models pose so much better than you English people do—that's a capital smile!—and then they dress so much better. Here you have people who don't know how to dress at all; they come arrayed in glaring satin or a nasty shiny grey, like that you are wearing—capital laugh that; just keep it on—thank you."

M. Lafosse's principal studio, which is about fifty feet long, is tinted a dark grey-green. There is a skirting board at the light side eighteen inches from the ground; then three feet of ground-glass, and above that, sloping inwards, three feet of clear glass. All or any portion of the ground-glass may be shut out by opaque sliding screens, and there is a very ingenious arrangement for modifying the top-side light that comes through the clear glass. A row of small white screens hang down from the roof, and in this position do not obscure the glass. But if sloped to the right or left—and by means of a frame-work they all move together—the light is reflected on to or away from the sitter, or by pulling taut the glass obscured altogether. The screens, indeed, are constructed something after the manner of a Venetian blind. The studio contains a vast number of clever properties, but the best of all is a large musical box, which M. Lafosse finds exceedingly useful when making exposures, as sitters then have something else besides themselves to think about at the eventful moment.

In working, M. Lafosse believes it well to make up collodion and silver bath in batches. For instance, he makes up one hundred ounces of nitrate of silver into bath, and mixes up at the same time as much collodion as he is likely to require for the same. When these are expended, he prepares fresh supplies. In the same way he albumenises a hundred or a thousand plates at a time, for M. Lafosse invariably employs an albumen substratum both for ordinary work and for his opal enlargements. The varnishing is done in an ingenious manner, which our readers will do well to note. Our host makes use of a little "cheerful stove." Along the top of it is a frame upon which a row of negatives are stood upright to warm, and when sufficiently hot they are taken one by one, coated with varnish, and the surface dried by being held to the front of the "cheerful stove."

M. Lafosse's retouching rooom is also worth making a note of. The light enters from a wide window in front, but a curtain depending from the ceiling shuts out direct illumination, except where the row of retouching frames are placed. The ceiling and wall behind are painted a dark neutral tint to absorb the light and not to reflect it, so that while the apartment is softly illuminated, the light behind the negatives is still exceedingly vivid. Altogether this retouching room is a model.

M. Lafosse is of opinion that something novel is necessary to give healthy impetus to photographic work, and he has not much faith in the promenade or any other style of portrait effecting such beneficial change. "We do not want merely a variation in the cutting or mounting of photographs, but some modification of the photograph itself. A real cameo, or bas-relief portrait, in which the face stands out from a dark background, would make an attractive picture, for example, if we could only produce such things." Possibly, now the Woodbury patent has lapsed, we shall have some attention given to the production of photographic portraits in relief; at any rate, M. Lafosse's idea is well worthy of record here.

The "At Home" for next week will be "Mr. Payne Jennings at Dulwich."

PHOTOGRAPHY AS A DECORATIVE ART.

BY J. R. SAWYER.*

Porcelain—*continued.*

The methods of applying photographs to enamels or porcelain by means of the powder and substitution processes, although fairly adapted to small work, and as a foundation for colour or monochrome finish, can scarcely be considered as more than the basis for after treatment; but it seems strange that, with the varieties of oxide colour at the disposal of the operator, greater variety and perfection of result has not been hitherto obtained. It would appear that, if a practical application of photography on a large and commercial scale be desirable, it must be sought for in the direction of a process analogous to the carbon, or, more properly, the pigment processes known as autotype.

There are certain conditions peculiar to the nature of the work, which all experimenters in this direction well

* Continued from page 437.

know cannot be overlooked. In the first place, colours with a large amount of flux are quite inadmissible, as although it is possible to mix them into gelatine or a similar vehicle, the amount of lead in the flux will interfere in a most remarkable manner with the sensibility of the tissue, by combining with the chromic acid, and forming a chromate of lead, at the same time making a yellow stain on the material when it is fired. There is also another difficulty: the pigment is diluted, so to speak, by the flux, and gives a poor, weak image, instead of a bold and vigorous one. But, it will be asked, why employ a colour with flux in it at all? For this reason; that if a pure colour is employed, it is necessary to raise the temperature of the porcelain in firing to a heat sufficient to fuse or melt the glaze of the porcelain itself, and, in melting, incorporate the colour into the original glaze, whilst the fluxed colour melts at a much lower and more convenient heat, and is fused on the top of the original glaze.

It will now be understood what is meant by under-glaze and over-glaze colours; the former having to be incorporated with the glaze already on the ware, by means of a heat at least as great as that of the "glost oven" previously described; the latter being fused upon the glaze at a much lower temperature, on account of the easily fusible material with which the colour is mixed; but this material, unfortunately, interferes with the success of the operations, by making the tissue insensitive to the action of the light, and, if this is overcome, as it may be, by immersing a second time in the bichromate solution, then by giving a poor, weak image, instead of a bold and vigorous one.

Thus it comes about that colours as nearly pure as possible must be employed to secure success in any efforts in the direction of printing by means of pigmented tissue upon porcelain. But then crops up this other difficulty: the firing—or, rather, the fusing—point of different colours, such as black, red, blue, are by no means the same, and they can only be brought into agreement by the admixture of some material—the flux, in fact—that gives way at a lower temperature.

The best plan to pursue until experience has been gained, is to take some simple colours, such as black, brown, blue, and red, being careful that they are what are called under-glaze colours; these are sold by the ceramic colour-makers in the form of fine powder. Take a little of each of the colours, and rub them up separately with a glass muller and a little fat oil of turpentine; now take a small piece of the porcelain upon which it is proposed to operate; make a rubbing of the colours, and have it fired; this preliminary experiment will give an idea what shade the colours will be when fired, and how far they agree or differ as to the temperature to which they must go.

Having settled upon the colour, the next thing is to get it into gelatine; but gelatine is an awkward substance to manipulate, as, if it is in sufficient quantity to hold the heavy colour, it will be very likely to "frizzle" on the porcelain when it begins to feel the heat. This frizzling is a great nuisance; it means the entire ruin of the picture; for as soon as the heat of the muffle begins to tell upon the plaque, the gelatine contracts, bursts up, and brings picture and all with it.

The hard, strong gelatines seem to be useless in this respect; but the weaker forms—such as the soup gelatine of Cox, and the weaker sorts of Nelson—promise most hopefully. Having selected the gelatine, make a solution of 25 per cent., adding to this about 10 per cent. of white sugar. Now, with a slab and marble muller, grind up the colour selected, in water, to the finest possible state of division. The quantity of colour to be added to the gelatine must be determined by experiment, as it will vary with the strength of the colour, and the strength of the gelatine into which it is to be put. The colour itself being heavy, it will not be possible to get any very large quantity into the rather weak gelatine that must necessarily be employed. The colour, being well ground, must now be stirred into the warm gelatine, and if some arrangement can be made for agitating or churning it vigourously for an hour or more, the result is more likely to be successful. The gelatine and colour must now be strained, and, after standing some little time, will be ready for use. To make the tissue, procure some pieces of plate-glass, cut some sheets of Rive paper a little smaller than the glasses, damp them thoroughly, blot them off, and lay them down upon the glasses, smoothing out the creases, and attach them round the edge with a little gum; when dry, pour upon them sufficient of the prepared gelatine to give a thickness of about one-eighth of an inch, having previously levelled them carefully. When the gelatine is set, they may be reared up to dry, and, when dry, they will be ready for sensitizing.

To make the tissue sensitive, put into a tin dish a little larger than the sheets a five per cent. solution of bichromate of potash, and immerse each sheet for about three minutes in summer, and five minutes in winter. These should be treated very carefully, to avoid air-bubbles. The sheets should be hung up in a room made dark, or illuminated with non-actinic light, and, when dry, should be taken down, and kept from light and atmosphere in a tin case.

The printing must be conducted in exactly the same manner as ordinary carbon printing, and with the aid of an actinometer. The pictures must be printed very deeply, and if the negative is at all hard, a little exposure of the print to daylight (say from four or five seconds) after the sheet is taken from the printing-frame will improve it, by conferring a certain amount of softness. If the print is from a reversed negative, it may be laid down direct upon the surface which it is proposed to decorate, and, in that case, no substratum will be necessary. If the print is from an ordinary negative, it must be developed, in the first instance, upon a provisional or temporary support.

As the porcelain has frequently a curved surface, and even a plaque or tile has an uneven surface, it necessarily follows that the temporary support must be flexible. There are two kinds open to the experimentalist, viz., the india-rubber paper of Mr. Swan, and the flexible support introduced by the author. At the Autotype Works the latter alone is used, as it answers the purpose, and is much more simple and economical than any other kind. Pieces of flexible support a little larger than the pictures are rubbed over with the proper waxing compound; this is applied with a light circular sweep of the hand, as if the object were to polish the surface of the support, in the same way that a French polisher treats the articles he manipulates. The sheets are laid aside for the spirit to evaporate, and are then ready for use. The printed tissue is placed in clean and very cold water, and, as soon as it is softened, its surface is brought into contact with the polished surface of the support. Both sheets being under water, they are lifted together, and absolute contact secured by a few strokes of the squeegee; they are allowed to rest a few minutes, then placed in warm water, the tissue paper skimmed off, and the picture very carefully developed. Considerable care is necessary in this part of the process, as the gelatine employed, being necessarily weak, the colour will be so loosely held as to be easily washed away if the water be too warm, or the action of development too vigorous. The picture, being developed, should have a much darker appearance than is desired in the finished work; if not, it will burn away to a mere shadow.

The picture developed upon the temporary support should be allowed to dry before transferring it to the surface upon which it is proposed to finally place it; when dry, the picture on the support is immersed with the plaque, tile, or piece of ware, upon which it is to finally rest, in a solution of gelatine, to which sufficient chrome alum has been added to slightly thicken it; the two are squeezed together, and, when dry, the support will leave the picture

firmly attached to the porcelain. Pictures printed from reversed negatives can be put down at once on the surface to be decorated, and developed at once upon it.

The next question, of course, is the firing, or burning-in, but this is a matter which nothing but the practical skill of the potter can effect successfully; it must be done in a regularly-constructed fire-clay muffle, or kiln, heated by a furnace which will raise the whole to something like a white heat, so as to re-melt the original glaze of the ware, and, in doing so, put the photograph under the glaze.

This branch of the photographic art is at the present moment quite in its infancy; if a demand arises, facilities will doubtless appear to enable the potter and the photographer to work together; and probably the reproduction of original designs, too elaborate to be done cheaply by hand, might be made a new development of photographic business. The best way to overcome difficulties is first of all to know clearly what they are. The author of these articles has painfully worked his way to some small measure of success; but this success depends so greatly upon the experience acquired by careful observation of results, that it is next to impossible to do more than indicate the rocks a-head, and to save other experimentalists some amount of shipwreck.

PHOTOGRAPHY IN INDIA.

BY W. T. WILKINSON.

In continuation of the article in the News I would like to say a few words about the climate in its relation to photography in general, and materials used in particular.

That the climate in India varies considerably in some portions to others will be guessed when the vast extent of the country is taken into consideration, embracing, as it does, the moist, even temperature of Ceylon and the Madras Presidency, and the alternate hot, dry, and moist atmosphere of the Central and Northern Provinces.

The first-named district, lying, as it does, in the direct path of the N.E. and S.W. monsoons, the atmosphere is almost uniformly moist, and the temperature very even, rendering photography a very pleasant task, and notcurtailing the working hours much, even in the hottest weather.

In Central India, what is usually termed the cold season, from November to March, is the best time of the year for photography, as then nearly all the day can be utilised without inconvenience, the effects of the cold nights on the chemicals being speedily neutralised by the warmth of the sun each morning. The same may be said of Northern Provinces, or the Punjaub, except that, being so much further north, the days are shorter and the nights colder. In fact, so cold are they that water placed out of doors in shallow earthenware vessels is frozen during the night, a method whereby, in most stations, the bulk of the ice for each summer is collected.

The summer months in Central and Northern India are excessively dry and hot, rendering work too laborious and unpleasant, except in the early morning. During the passage of the monsoon, however, the dryness gives way to excessive moisture, and this is what tries the constitution of all kinds of woodwork; but neither in Southern India, nor in the North and Central, have I ever come across an English-made camera that had been affected by the climate, and I have worked with cameras made by Ottewell and Co., in the olden days of solid cameras, as well as with the acme of modern instruments, Rouch's Patent Portable, than which, it seems to me, impossible to get a better camera, uniting, in such a degree, lightness and strength; the one I had was not brass-bound, or specially made for India, but it stood the test well, and was the admiration of all who saw it.

However, during the summer months everybody goes to the hills, so that the extreme heat of the plains is avoided, and strength gained for work when the cold season comes round again.

Photographic material has many more vicissitudes to undergo during the voyage to India from England than after arrival, and, if care be taken, previous to packing, to have both goods and cases thoroughly dry, no complaint should be made of deterioration.

One lot of albumenized paper I had in Ceylon came to hand quite spoilt, giving proofs spotty and full of red stains; this I attributed to the paper being packed in cold, damp weather, and both paper and case damp and cold: no doubt but what the heat of the ship's hold had caused mouldiness, and consequent spots and stains.

Glass for negatives requires to be smeared with grease on both sides, else the chances are that, on arrival, the surface will be corroded, and entirely spoilt.

The method of packing collodion now adopted by the various makers is as near perfection as possible, but as it is only carried as a deck cargo in company with mineral acids, &c., at an enhanced freightage, and as the scorching heat often causes the acids to explode, the accompanying collodion, as often as not, shares its fate in being thrown overboard, and it cannot be wondered at that the price is on the average Rs. 10 per lb.

Collodion emulsion is easy enough to work in India, and, with careful working, ought to quite supersede the bath.

Gelatine is much more difficult, but if care be taken to use cold water for washing, ice being almost always procurable, experience ought surely to bring the process into nearly as general use as at home

M. PAUL DESMARETS ON AERIAL PHOTOGRAPHY.*

Ever since a balloon has been raised in the atmosphere, aeronauts have been struck with the clearness with which terrestrial objects can be discerned. The idea has come to several to endeavour to fix such beautiful and varied views by photography. M. Nadar made his first experiments in 1860 in a captive balloon, which M. Henry Giffard had kindly put at his disposal at the Hippodrome. In 1878 this celebrated engineer authorized M. Dagron to continue M. Nadar's researches; he succeeded in taking a panoramic view of Paris in the direction of the Pantheon.

The more complex and important problem, that of photography in a travelling balloon, still remained to be solved. Although M. Janssen, in the account of his ascent in the *Volta*, during the seige of Paris, remarked that it was quite possible to take negatives in the car in certain cases, very few have attempted this experience, and with very imperfect results; either sufficiently heavy ballast was wanting, or the plates were smashed in descending, &c.

When I ascended from Rouen on the 14th June last, I was fortunate enough to obtain two negatives under extraordinary circumstances. My apparatus consisted of a camera, an aplanatic lens, an electric instantaneous shutter, and gelatino-bromide plates. The lens, of French manufacture, was by Derogy; it was an aplanatic, 21 by 27, with a focal length 0.29m. For the shutter I used an apparatus contrived by myself, conjointly with M. de Gombettes, who undertook its construction. This shutter, which we have designated electro-photographic, permits the exposure to be regulated from instantaneity itself (a minute fraction of a second) to that most prolonged. It is composed of an ebonite disk, pierced with two circular apertures, equal in diameter to those of the objective, and placed symmetrically upon a right line passing through the centre. This disc is rotated by clockwork, more or less rapidly. The escapement works by an electric current, acting upon two electro-armatures, and the force is generated by two small sulphate of mercury batteries of M. Trouvé. The gelatino-bromide dry plates were prepared by M. Laisné.

* Bulletin of the Photographic Society of France.

My photographic experiences have been carried on in the Gabriel balloon, of 1,225 cubic metres, belonging to the Society of Aeronautic Experiences, of Paris, of which M. Jovis is the director. It was managed by M. Lair, who was aided by M. Marquelin.

It was at 6.30 p.m. when I took my negatives, through a mist. The exposure was about one-twentieth part of a second, and the speed of the balloon was from six to seven metres per second.

One of my plates represents the commencement of the village of Meslin-Esnard, near Rouen. The photograph is reduced about $\frac{1}{1000}$. It was obtained by placing the camera vertically, the lens passing through a hole pierced through the bottom of the car.

The other represents the view from Rouen to Quillebœuf, showing the windings of the Seine and the clouds. I placed my apparatus horizontally on the edge of the car. Rouen and the earth were shrouded in mist.

I have had this latter print enlarged by M. Carette, of Bois-de-Colombres, and it brings out several details which are not to be seen in the small picture, even with the magnifying-glass.

These photographs may be of great use in the future, both in topography and meteorology, as well as in the army.

PHOTOGRAPHY AND MAP MAKING.*

I have the honour of presenting to the Photographic Society of France, on behalf of our colleague M. Civiale, a large map of the Alps which he has just finished, and which has been executed under his immediate direction. It is the result of twenty-two years' work carried on with the greatest care.

Photography has played an important part in this work; it has been used in ascertaining the exact height of the greater number of the summits. For years, M. Civiale has gone over the Central Alps, beginning by the mountains of Dauphiné, in the west, as far as those forming the frontiers of Carinthia on the east. Over this vast space he took forty-one photographic panoramic views, each comprising a complete circuit of the horizon. The route followed on this series of travels is indicated by a red line on the map, showing the centre of excursion and the panoramic station point.

All the negatives have been taken on paraffin paper by the author's own process. M. Civiale determined not to use glass, although sharper, more rapid, and more delicate results would have been obtained, because in the use which he made of his negatives, had he broken one, the whole series would have been spoiled. It was, therefore, better that M. Civiale should not run the risk of such danger. The panoramas have been photographed with an apparatus placed perfectly level, and the focal length was so adjusted that it is identical with all parts of the view.

The horizon of the station point is determined by a line passing through the point, the height of which has been accurately calculated by the barometer, and passing through two or three other points also determined on the panorama by means of tested heights, whether by the barometer, or by triangulation; this horizon, once established on the different panoramas, will permit the height of all points to be calculated and verified in the following manner—

$$H = \frac{h \times D}{f}$$

H, represents the height of a point above the horizon; h, the height of this same point on the picture; D, the distance between the station point and the summit to be measured; and f, the focal length.

By the help of these views and calculations all the central portion of the map, from west to east, has been constructed.

The scale of reduction employed is 1-600,000th, in order that the whole may be printed on one sheet to form a portable map. Photography has again been called into service for the purpose of reducing to one uniform scale, by aid of the camera, and also for joining the central chains as well as the surveys made on the land.

* Read by the Secretary to the French Photographic Society.

The drawings of the frontiers, roads, railways, either existing, or in course of execution, have been traced with great care, and the photographic routes followed by the author during six years of travel, give tourists precise indications as to the parts they can travel through. Even the names have received great attention, and M. Civiale has endeavoured to bring back the foreign names to their true orthography.

This work has been the subject of a communication to the Académie des Sciences, and to a special commission. Once more affirming that photography is of great use in many ways when specially applied, I wish to be the interpretor of the Society in thanking M. Civiale for the gift of this map, and in congratulating him on having succeeded so well in such a large undertaking.

BELGIAN INTERNATIONAL EXHIBITION AT GHENT.

The following is the list of awards :—

All State departments or establishments connected with the Government were ruled *hors de concours.*

A. *Heliographic Engraving.*—For the largest and finest impression, a prize of 250 francs, a silver gilt medal, and a diploma, awarded to M. Charles Klic, painter, Vienna. Second prize, the sum of 150 francs, a silver medal, and diploma, awarded to M. P. Arents, photographer, Paris. Third prize, a silver medal, and diploma, M. Evely, of Brussels.

B. *Phototype on Stone or Metal.*—For the largest and finest impression, a prize of 250 francs, a silver gilt medal, and a diploma, awarded to M. Strumper, of Hamburg. Second prize, the sum of 150 francs, a silver medal, and diploma, M. W. Hoffman, of Dresden.

C. *Woodburytype and similar processes.*—For the largest and finest impression, equal prizes of 200 francs, silver gilt medal, and diploma, to Mr. Woodbury, of South Norwood, for the Woodbury process and modifications of the same; and to Mr. Bruckmann, of Munich, for applications of Woodburytype.

D. *Photography in Pigments.*—For the finest and most numerous collection of prints, whether direct or enlarged, a prize of 150 francs, a silver medal, and diploma, to M. Hallez, of Dinant. Second prize, a sum of 100 francs, a bronze medal, and diploma, to Mr. John Moffat, Edinburgh.

E. *Vitrified Photographs.*—A prize of 150 francs, a silver medal, and diploma, to M. A. Leisner, of Waldenburg.

F. *Cyanotype or Plan Printing.*—A prize of 100 francs, a silver medal, and diploma, to M. Oscar Kramer, of Vienna. Second prize, a bronze medal, and diploma, to M. Ed. Sacré, of Ghent.

G. *Photographs in Salts of Silver.*—For the finest and most numerous collection of large prints distinguished by elegance and originality of subject, and the least retouched, equal prizes of 100 francs, silver medal, and diploma, M. Angerer, of Vienna; M. Maier, of Munich. Second prize, silver medal, and diploma, Mr. Annan, of Edinburgh.

H. *Apparatus.*—A prize of 100 francs, silver medal, and diploma, to M. Jonté, of Paris. Second prize, bronze medal and diploma, to M. Corroyer, of Brussels.

Further the Jury accord:—

A medal of silver gilt and a *diploma* to Mlle. Relvas, of Gollega, Portugal, for her fine exhibit.

Silver medal, and diploma, to M. Hartwig, of Magdeburgh, for enlargements; Madame Dupont, of Brussels, for the application of electric light to photography; M. Zeyen, of Liége; Mr. Hare, of London, for apparatus; M. Tizemeski, of Lemburg; M. Lowy, of Vienna; M. Jaffé, of Vienna; Mr. John Davies, of Edinburgh, for his platinotypes.

Bronze medal to M. Schöber, of Durlach; M. Baeckmann, of Carlsruhe; Toulouse Photographic Society; M. Ladislas Reinhardt, of St. Petersburgh.

A prix d'excellence, consisting of 300 francs, a silver gilt medal, and a diploma, was awarded to M. Klic, of Vienna, for his heliogravures.

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WHAT CAN BE DONE IN LANDSCAPE PHOTOGRAPHY.

THE well-worn regret—"What a pity you cannot photograph in colours!"—is still occasionally to be heard among photographers and their critics, although it must be admitted that the cry is always more rife among those who are unacquainted with the real capacities of the camera. It is a pity, no doubt; but before lamenting over things that the photographer cannot do, it would be well to thoroughly understand how much the camera can do, especially in the matter of landscape photography. The rosy sunshine and blue sky, the azure lake and purple heather, may not be capable of reproduction on a sensitive plate, and this is certainly subject for regret; but while waiting for the accomplishment of these wonderful things, do photographers make all the use they can of the power in their hands? We doubt it very much! Landscape photographers, there are, it is true, both in the ranks of professional and amateur, who have successfully reproduced Nature's pictures; but the number is so small, that their results are looked upon rather as extraordinary *tours de force* than as the intelligent results of camera work. We make little fuss over the numberless paintings of high excellence that are produced, year after year, by artists with brush and palette, and yet beautiful pictures secured by the aid of the camera are still looked upon in bewonderment.

The reason for this is that picture-making is little studied among photographers. Some have not the capacity nor the art-knowledge, others lack only perseverance and observation. Some, again, fail, not for want of art-culture, but from inexperience of photography. They do not know, as we have said, what the camera can do and what it cannot do. Indeed, we fully believe that there are many capable persons who, because they know the sensitive plate cannot reproduce colour, do not give themselves the trouble to make pictures with the camera at all.

This is a great mistake. The camera in the hands of an artist and photographer can still make charming studies, albeit they do not contain the tints of the rainbow. Here is a placid lakelet, a slender birch tree upon its grassy bank; how much, think you, of this scene can the camera paint? Let us look. The outline of the tall stem bending over the water, its silvery bark and feathery foliage, are all here in the picture; the gentle slope of the bank is softly limned, broken here and there by the big, rigid thistles growing among the meadow land; and down at the water's edge we see the bright pebbles shining through the translucent wave. Mirrowed in the water itself are the tender twigs and hanging boughs of the "Lady of the Lake," each tiny leaf visible in the clear reflection, while beyond a mass of lichened rock, lit up in the sunshine, is shown in our photograph in shades of black and grey and silver.

We will now move the camera to a country lane, where there are big grey ruts in the road, and a honeysuckle bough overhanging the path. A country cart, stacked with yellow straw, by the wayside, is reproduced at one side of the picture, and a billowy mass of clematis, its snow-flecked greenery rendered with rare delicacy, is on the other. The delicate tendrils of the honeysuckle above, and the sharp serrated leaves of a bramble below, are conspicuous in our picture, as is also the white blossom of gossamer meadow-sweet; the road itself is dappled with sunshine that comes through the hazel copse on our right.

A picture taken in the woods, of ferns and delicate undergrowth would be just as successful as if we had a Robinson or England, Bedford or Payne Jennings, to direct our camera; or last, though not least, a Russell Manners Gordon. The art of making landscape pictures is, indeed, in its infancy; but it is, nevertheless, matter for surprise that, with the examples of their masters before them, photographers should have taken up so little with the work. Many, of course, are occupied in other branches of photography, and many more have plenty to do without engaging in work that can only give an adequate return when signal success is achieved. But we do not despair of seeing the time when, among the photographic profession, there will be a large body who, like our landscape painters, earn their bread by the production of high-class pictures.

A METHOD OF PRODUCING DIRECT POSITIVE TRANSPARENCIES IN THE CAMERA.

DURING his visit to this country, a few weeks ago, Dr. Vogel called our attention to a process which had recently been communicated to him of producing positives of a transparent character direct from nature. The method, which Dr. Vogel compared to one foreshadowed nine years ago by Colonel Stuart Wortley, but not practically elaborated by that gentleman, has now been published in the *Mittheilungen*, and in support of it, Dr. Vogel tells us the author submitted to him a series of pictures all possessed of surprising delicacy and harmony, evidencing plenty of proof of the value of the process.

The elaboration of the process is due to an amateur, M. F. Jähns, a civil engineer, and one of the officials of the Rhenish Railway. Some time ago, he tells us, when experimenting with collodion emulsion and various kinds of developers, he put on one side a number of plates which had been developed, but not washed. On one of these plates, which had been fully developed, he found, to his astonishment a patch about the size of half-a-crown, where the image was not negative, but positive. The positive portion of the plate was as clear, too, and finely detailed, as was the negative portion; in fact, in M. Jähn's own words, the positive was as beautiful and finely marked as any paper print from the plate could have been.

It remained, then, to find out how this transposition, or reversal, had come about. As the developer had not been washed from the plate, it was but natural to infer that its presence, and the subsequent action of diffused light upon the film, were the causes of so strange a phenomenon, and this, in the end, was found to be the case; making a series of experiments, M. Jähns found that, by permitting the developer to remain upon the fully-developed negative, there was produced, on allowing diffused light—or, better still, sunlight—to act upon it, a fogged plate. As the fogging came over the plate, the negative image gradually disappeared, and then soon afterwards a positive image began to make its appearance, in which the lights and shadows of the original were reversed. There was, however, fog still remaining on the plate when the positive had been produced; for, although the fog could be, to a certain extent,

kept down in the process of transformation by treatment with tincture of iodine, it could not be obviated altogether. Neither did subseqent bathing of the positive in a hyposulphite or cyanide bath effect the purpose satisfactorily; indeed, this radical treatment frequently, as might be expected, caused the image to disappear altogether.

M. Jähns next experimented with iodised collodion and an iron developer, but as no results were here obtainable, he was led to infer that the presence of ammonia was the key to the phenomenon. Ammonia was in excess upon the exposed plate, he reasoned, and dissolved the silver film formed on development in the dark room; further, the pyrogallic acid present at the same time developed, under the action of diffused light such parts of the negative as had not been impressed in the camera. Dr. Vogel hardly thinks that the dissolving of the silver image in this way is probable; but we may here remark that we are only quoting M. Jähns's theory of his process.

To effect the dissolution of the negative image more energetically, M. Jähns employed strong nitric acid; this answered the purpose completely in all cases where bromine salts were employed in the image, the positive image remaining behind on the plate clear and distinct. This positive had now to be exposed anew to daylight, under the action of a developer, in order to secure a plate free from fog.

Our readers will find in M. Jähns's process much that is already familiar to them; but we have Dr. Vogel's word for it that it is not a mere laboratory experiment that is here detailed, but a practical process whereby transparent positive photographs may be produced directin the camera—the clear and delicate qualities of which vie with those of a thoroughly good negative.

Notes.

Professor Graham Bell, the well-known inventor of the telephone, has lately succeeded, it is said, in still further improving telegraphic communication. He employs a beam of light in place of a telegraph wire, and conveys sound from station to station by the aid of this shining ray. Professor Bell has telephoned along a beam of light in this manner to a distance of 800 feet.

He performed the feat by the aid of selenium, a substance, as we have pointed out in these columns, that undergoes considerable electrical change according as it is placed in light or shadow. By constructing the "receiving instrument" of this material, and controlling the form and character of the light vibrations that fall upon the selenium, sound can be controlled, and all varieties of speech reproduced. At any rate, so says the paper which Professor Bell recently read before the American Association for the Advancement of Science.

A novelist of our acquaintance has copies of his MS. taken by photography. As he reads and corrects a chapter sometimes a month after it is written, the copying press is unsuitable. A friend of his, however, has no difficulty in reproducing twenty quarto pages on a twelve-inch plate, the writing, though very small, being perfectly legible to good eyes. The MS. of a three-volume novel, like Homer's Iliad, might thus be contained in a nutshell, provided it is a cocoanut, to which the story-teller of old referred.

M. Pifre has communicated to the Paris Academy of Sciences some further results which he has obtained in his endeavours to utilise heat from sunshine. When the sky is clear he has no difficulty in getting sunshine to boil water, in a boiler he has specially constructed, within the space of forty minutes. This is certainly making the sun into a useful servant.

The boiler in question is comparatively large, containing no less than 50 litres of water. The solar heat is concentrated by means of a reflector upon the blackened surface of the boiler, the reflector consisting of three truncated cones placed at an inclination of 45°. Steam can only be got up, of course, on a clear day, and is maintained so long as the sun shines.

Among the officers killed in the last action at Candahar, under General Roberts, is the Superintendent of Signalling, Captain Straton, who has done such marvels with the heliograph during the campaign in Afghanistan. The service was a most hazardous one, since it consisted in placing mirrors upon lofty eminences and isolated spots whence signals could be reflected a long distance; it was when engaged upon one of these expeditions at the close of the campaign that the gallant officer met with his death.

These mirrors are but ten inches in diameter, and, if placed on a high hill, signals may be flashed over the heads of an enemy to a distance of fifty or sixty miles. There is no fear of hostile calvary cutting the line of communication, as if it were a telegraph wire; and, moreover, it is only those accurately placed *vis-à-vis* who can read the signals. These appear to the eye like tiny bright spots or stars in the landscape afar off, and, as they remain visible to the eye for a short or long time, they are termed short or long signals, and of these the signal alphabet is composed.

It is a pity the term heliograph has been given to this form of signalling, as the word has already been appropriated by photographers. But there is no reason why the camera should not be called in to write down these light signals, and thus produce a veritable heliograph. A telescopic tube in front of the lens would be necessary to get a definite image of the point of light as it appears and disappears; and if the camera were fitted with a movable band of sensitive tissue (say the Warnerke tissue), we should have a very serviceable "receiving instrument." Since the sensitive film would always be moving at a certain speed, short signals would then be written down in the shape of a short line, and long ones by a long line, exactly as in the well-known Morse code.

A Paris photographer on the Boulevard des Italiens has hit upon a plan of operating and advertising at the same time. He employs electricity for taking pictures at night, and instead of hiding his light under a bushel, permits it to shine down upon the cafés and promenaders in that populous thoroughfare.

According to Vogel, solutions of gelatine in organic acids may be diluted with alcohol without any precipitation of gelatine.

Obernetter has gone a step further, and discovered that the acids most favourable to the purpose are boracic acid, acetic acid, formic acid, citric acid, lactic acid, oxalic acid, succinic acid, benzoic acid, &c. A ten per cent aqueous solution of oxalic acid or succinic acid easily dissolves half its weight of gelatine, we are told, and this may then be diluted with three times its volume of absolute alcohol, without any precipitation taking place. In this way a solution is obtained which, at a temperature of 19° C., is of the consistence of ordinary collodion; but below this temperature the mixture sets. The solution may, indeed, be still further diluted with eighty per cent. of alcohol, supposing this contains one or two per cent. of acid.

Another fact of interest to employers of emulsion may be cited. If dry gelatine emulsion is dissolved in twice its weight of water containing one of these organic acids, and three volumes of absolute alcohol are then added, an alcoholic gelatine emulsion is obtained, which pours like collodion, and dries in the space of an hour. The film, too, works with the same sensitiveness and clearness as if the emulsion had simply been dissolved in water.

In a word, it may be said that the organic acids do not influence the sensitiveness of gelatine emulsion in the least degree. On the other hand, Herschell's plan of getting alcohol to dissolve gelatine by the addition of aqua-regia (nitro-hydrochloric acid) very materially interferes with the photographic properties of bromide of silver.

We were remarking the other day to a Cambridge photographer on the flatness of the country around the University town. "Yes, it is flat," he said; "if you take a point in this direction, straight across by those farm buildings there, they say you never get to a bit of rising ground until you come to the Ural Mountains."

Topics of the Day.

LIGHTING THE MODEL.

BY LYDDELL SAWYER.

I HAVE just lately read Mr. H. P. Robinson's "Pictorial Effect," and I am enchanted with his lucid and earnest style of expounding art. Mr. Robinson's little book is a gently-sloping pathway, leading the student in easy stages up to the principles of art, yet it avowedly treats of the principles only, leaving details to be supplied by ourselves. Hence my essay.

There are only two classes of lighting which the photographer has to deal with in the studio: these are general or ordinary, and so-called "Rembrandt" lighting; all others are only modifications of the above.

As a rule, the aim in an ordinarily-lighted photograph is to obtain a gently-diffused middle tone over the face with tips of somewhat concentrated twilight on the prominent features, forming a true descending scale from the broad pure whites of the forehead to the minor whites about the chin, while the off side of the face forms a connecting link between the half-tones and the shadows.

Now, to obtain this light, the natural inclination—and, indeed, what I have known some photographers practise—is to keep the sitters back, and to draw the curtains from behind well forward, the operator contending that this will cast shade enough over the necessary parts of the face, and still give the prominences a chance of retaining a greater proportion of high-light.

But this course is entirely erroneous—exactly contrary to what should be adopted. What is wanted is to work under ground or otherwise obscured glass, which yields soft diffusion, and prevents alike harshness of top-light or shadow; the sitter may be brought directly under the skylight, and the forward curtains drawn to meet him—not the back ones, unless it is only a small side curtain, used at the discretion of the operator for the purpose of softening the cheek and neck.

Very little consideration of the laws of perspective will prove how, by bringing the subject so forward, the horizon being above his level, of necessity rises further, and excludes more light from the most readily-shaded portions of the face. I would also recommend the use of a long sloping roof (one sided) rising from about six and a-half to eleven feet; this gives further power to the operator to increase or diminish the concentration of light according to what I may call the lateral placement of the sitter.

A white cotton reflector may be added to the requisites for these arrangements, and then the operator has the power of general lighting in a nut shell. Yet, simple as it may seem, he will find it as injurious in its abuse as it is beneficial in its judicious use. For instance, it would not answer for cases of deep set eyes, or freckles, which require a broad amount of front light and full exposure.

Apropos of sun-tanning, there is a particular I have noticed which in practice, as sometimes is the case, somewhat contradicts theory. It is, of course, averred that the orange rays of light are non-actinic, or almost so, and hence these yellow markings in the face are not grasped in the photographic image; but I believe that the portion, or principal part of it, which is visible to the eye, yet invisible in the subsequent photograph, is not lost, but merely transferred to the immediately adjacent lights. Therefore, these same lights have more than their relative value, and when the retoucher fills up the freckles to be even with their surroundings they must undoubtedly be out of tune.

Rembrandt lighting is, as a term, a misnomer, inasmuch as the painter of that name was peculiar for his bold rendering of lights and shades in all positions of his subjects, sometimes limited to a single ray of light, as in his Jewish Rabbi, or again utilizing greater breadth, as exemplified in the portrait of himself. But our acceptance of the term "Rembrandt" is only in the limited sense of profile heads lighted strongly on the outline, and the remaining portions of the face in strong middle-tint and shadow.

In the hands of a capable photographer this is a very pleasing class of portraiture with certain subjects; notably, young ladies with a profusion of loose hair, or men with flowing beards on which the high lights may be repeated in a lesser tone, thus preserving balance in the picture, and forming a more complete unity with the shadows.

The use of draperies of a neutral colour is advisable in Rembrandt pictures; if light, they should be of flimsy open texture, such as muslin or otherwise, at least with some indistinct pattern. Black clothes should, when possible, be avoided, it being generally beyond the tention of the chemicals to truthfully pourtray, at once, the delicacies of the facial tones, and the heavier details in dark draperies.

The best position for obtaining Rembrandt lighting is to advance the subject well into the centre of the studio, and to work from a diagonal point, or, in other words, to use as much the breadth as the length of the room. The background should be opposed to the sky, and the sitter just so far from the edge of it as to prevent the skylight from peer-

ing into the lens, and causing fog. The use of curtains, still forward of the sitter, and a white semi-transparent screen, capable of being suspended over any given point, completes the operator's modelling arrangements; all else must be supplied by his judgment. And no inconsiderable amount of skill is required. The exposure must be so well timed; the poise of the head answers for so much; the altered position of the body produces such change; the necessity of perceiving the difference between a simply well-lighted head, and a head that is photographically well-lighted,—in short, it is like an over-grown, ill-defined road, whereon the traveller may only deviate with danger, after many times carefully traversing the indistinctly marked course.

Artificial lighting just now holds a large share of photographic attention, and I am rather astonished that so many of the productions by the method are accepted with such good grace; it seems as though the fact of them being photographs by artificial light is sufficient passport for innumerable hosts of faults!

It is a pleasing feeling to know that we can always command light of photographic purity, that we are no longer dependant solely on the caprices of Sol; and we needs must feel truly grateful to those who work to place us in that position. I know one gentleman at least—I allude to Mr. P. M. Laws, of Newcastle-on-Tyne—who deserves the best thanks of the photographic community for the generous manner in which he has given the valuable results of his prolonged labours and numerous experiments to them, untrammelled with patents or aught by which pecuniary benefit will accrue to himself. Yet, meanwhile, we are playing with fire, as long as artificial light is confined to its present concentrated source; it should be manipulated only by him who can justly entitle himself both a thorough photographic chemist, and skilled artist.

Imagine this example of artificial lighting: the hair, a mass of black, excepting here and there on it a white patch designated top-light; the face, unnaturally greasy-looking the half-tones about the centre of it forbidding and heavy, and the reflectors (unveiled mirrors) playing on the off side of the face, rendering it only secondary to the opposing high-lights, the glare, from the slowness, destroying all the expression in the eyes, unless we apply that term to the squint; the clothes, a chaos of darkness culminating in an irregular outline contrasted to a light background, appearing still lighter by the addition of the details which it has purloined from the clothes. And there is little exaggeration in this representation—no need for it. It does not appear to be recognised that light derived from so limited a point is not capable of diffusing details in the lower tones to their approximate value with the stronger-lighted parts, as in the case of "Rembrandt;" while the details are apparent to the eye, they are still not powerful enough to be accepted by the photographic chemicals.

Careful exposure seems to partially obviate this purely chemical defect, and I have certainly seen some very creditable photographs taken by this light, bespeaking great skill and judgment on the part of the operator, amid these extra difficulties. Yet still, while being firm, they have had "artificial" written on them in unmistakable characters.

What is wanted is more breadth of light to make them really what they have been already characterized—that is, "equal to the best day-light portraits." I hope that the reason of my not having seen any artificial rivals to the sun's productions may be due to my limited observation. I trust, also, that the manipulators of these pictures which I have come across will, when their excusable enthusiasm has subsided somewhat, find themselves sufficiently unbiassed to give due attention to these too manifest defects.

The "Topic" for next week will be "On Scientific Accuracy in Instantaneous Photography," by J. Vincent Elsden, B.Sc. (Lond.), F.C.S.

METHODS OF OBTAINING DIRECT POSITIVES IN THE CAMERA.

BY FR. JAHNS.*

Having for a great many years as amateur availed myself of the help of photography in my profession, the introduction of emulsion processes, on account of greater convenience, was exceedingly welcome. Until the summer of 1876 I practised the tannin process, which gave very unreliable results; and since then I tried the collodion emulsion, the management of which I have been obliged to find out for myself. In order to watch closely the results of my experiences, I kept a certain number of my trial plates, besides noticing each plate before it was washed off. Out of ten fully-developed negatives which had been treated almost alike, I remarked, in the centre of one of them, a spot the size of a crown piece of an entirely positive nature, and more beautiful in gradation and half-tone than a paper print would have been.

The plate being perfectly dry, having remained about four days, an accurate determination of the remainder of the developer could not be made. By close observation it appeared that the positive spot must have been different to the surrounding negative portion before development, and that some preceding cause must have occasioned its formation. I therefore proceeded to experiment in every way by addition, or omission, in all combinations that circumstances allowed.

After a series of thirty-two experiments, I obtained a positive, although a foggy one, certainly, by submitting the plate, as soon as the negative image appeared, and with the developer still upon its surface, to the action of sunlight. Under the fogginess, the outlines became completely lost, and then changed to a positive image in light and shade.

By the addition of strong tincture of iodine during the exposure to light the fogginess could be partially removed. The method of dipping in a bath of hyposulphite of soda or cyanide of potassium was not always successful, the whole picture disappearing in many cases.

Working from another standpoint I tried the same method with iodized collodion which had been developed with iron, but no sign of the described action showed itself.

I can with certainty assert that the presence of ammonia gave a most essential impetus to the action.

The fogginess was also to a certain extent accounted for, since the dissolving of the negative precipitate and the formation of the positive took place at the same time, and could not be separately performed.

The best method of accomplishing separation was evidently by the application of nitric acid to effect the dissolving of the silver precipitate.

This method acted perfectly with all precipitates derived from bromine salts, and there remained then but that portion of the sensitive film which had not been acted upon by light in the form of a positive. The positive picture thus produced had again to be exposed to light under the action of the developer in order to obtain a silver positive free from fog.

The results appear to me excellent, and the skilful worker requires scarcely any further explanation in order to obtain a direct positive, the production of which, with regard to gradation of light and shade, can be proportionately increased in transparency.

I must just observe, however, that I have noted great differences in the action of various bromide of silver emulsions. They often seem to be attacked by the acid. This inconvenience is, however, to be obviated with absolute certainty by adding a few drops of bromide of potassium to dilute nitric acid; this compensates for that dissolved by the acid.

In astronomical photography and micro-photography the application of this method should be of considerable use

* *Photographische Mittheilungen.*

PROFESSOR BELL'S PHOTOPHONE.*

From time to time, annoucements have been made that the wonders of the telephone have been eclipsed by what, since the word "telescope" is appropriated to a better known but not really less wonderful instrument, I may call a "telegraphoscope," an appliance for seeing by telegraph. It was stated that Mr. Graham Bell was at work at the problem, and, if I am not mistaken, this distinguished inventor himself announced its solution a little while ago. However, Mr. Bell's work had either throughout another intention, or, as often happens in physical investigations, it branched off in a different direction and produced results perhaps originally unexpected. A full account of his latest research is given in a paper read by Mr. Bell himself at the recent meeting of the American Association for the Advancement of Science. According to this paper, which has just reached this country, Mr. Bell has performed a very marvellous feat indeed. He has succeeded in telegraphing, or rather "telephoning," along a beam of light. The beam of light took the place of the ordinary connecting wire, and by its means sounds produced at one end of the beam were reproduced at the other. The invention (for such it is, rather than a discovery) may or may not have any immediate practical application, but of the scientific interest attaching to it there can be no question. As with the telephone, simple means and well-known properties are made to produce startling results. Startling, however, as they are, they will certainly meet with ready acceptance here. There is nothing in Mr. Bell's paper which does not fit in with previously known facts, and its author's reputation alone suffices to prevent any hesitation in receiving his conclusions.

The curious properties of the rare metal selenium are well known to electricians, and have frequently been made the subject of experiment. The property which is believed to be peculiar to itself is that of offering more or less opposition to the passage of electricity, according as it is acted upon or not by light. It is therefore easy to conceive that if a piece of selenium were introduced into an electric circuit in which was also a telephone, alternations of light and darkness might be caused to vary the strength of the current, and such variations would produce sound in the telephone. This may be made clearer by considering the analogy of the microphone, for the selenium would act, in fact, as a microphone sensitive to light. In the microphone mechanical vibrations vary the conductivity of the materials of which the instrument is constructed. In the case of selenium the luminous vibrations affect the conductivity of the metal. In either case these vibrations of the current would affect the whole length of the current and would be manifested by a sound in the telephone. This idea was put forward by Mr. Bell himself in a lecture in England two years ago, when he stated that he believed it would be possible in this manner to "hear a shadow" fall on a plate of selenium. But it was found that attempts to realize the idea failed because the selenium was so bad a conductor; its "resistance" was so great that it could not be used with so sensitive an instrument as the telephone. Mr. Willoughby Smith, a well-known English electrician, stated at a meeting of the Society of Telegraph Engineers that he had succeeded in hearing the fall of a ray of light on selenium; but this experience does not seem to have been repeated. The solution of the problem appears to have been due to the discovery by Mr. Bell of a method of treating selenium by which its conductivity was increased. Selenium, like the more common element sulphur, exists in several states. In one of these states, the "vitreous," produced by melting and rapid cooling, it is a non-conductor. In its "crystalline" or "metallic" form, produced by melting and slow cooling, it conducts electricity, though feebly, and it is in this state that it has been experimented with. By a method of heating to a certain point and then cooling, and by certain improvements in the method of attaching the connecting wires, Mr. Bell succeeded in constructing "cells"—small plates fitted with conducting wires suitably arranged—of selenium, the resistance of which might be denoted as 3, while the best previously made was as 2,500 (300 ohms and 250,000 ohms) in the dark. On exposing the cell to light the resistance was diminished to about a half (155 ohms). By this means the fall of light—the blow struck by a ray—was rendered distinctly audible.

So far, Mr. Bell had only improved on what had been accomplished by other inquirers. His next step was more original, and one which, perhaps, would not have suggested itself to any mind not already intent on the problem of conveying sound from place to place. The idea once suggested, it is not difficult to conceive that if the intensity of the light falling on the selenium were caused to vary in correspondence with the vibrations, say, of the human voice, such vibrations would be faithfully reproduced in the telephone, and the voice would be heard. Further, the apparatus for thus regulating the impact of light might be removed to some distance from the selenium without affecting the result, so long as the beam of light shone with sufficient strength upon the sensitive cell. We should then have sound conveyed by light, or at least light affected by sound, at one point in such a way as to be capable of reproducing sound at any other point to which it might be reflected.

The apparatus used by Mr. Bell is of a sufficiently simple character. A plane mirror of flexible material, such as silver mica or microscopic glass, is employed to reflect the light—sunlight or a strong artificial light—concentrated upon it by a lens. The speaker's voice is directed against the back of this mirror, which is thrown into vibrations in the some way as the diaphragm of a telephone, and communicates these vibrations to the beam of light. The light reflected from the mirror is, after passing through a second lens, received at the distant station by a parabolic reflector, in the focus of which is placed a selenium cell in circuit with a local battery and telephone.

With instruments arranged as above described, Mr. Bell states that a number of trials have been made over distances too great to permit of sounds being heard directly through the air. The greatest distance mentioned is 213 metres, or about 230 yards. Mr. Bell believes that similar results may be obtained at whatever distance a beam of light can be flashed from one observatory to another. This belief requires experimental verification, and until it is so verified it will be wise to reserve the expression of opinion as to its possibility. Should the inventor's hope be realised, his apparatus will have important practical applications. In circumstances such as those in which the heliostat recently proved itself so useful, the "phonoscope" would be still more valuable.

For experimental purposes a different apparatus was used. By means of a perforated disc rotating before a fixed perforated screen, a beam of light was rapidly interrupted. These rapid alternations of light and darkness falling on the selenium produced a musical note in the telephone, the rotating disc itself being absolutely silent. Light is thus made to produce sound, and the ancient fable of Memnon's statue is realized by modern science. Aided by his rotating disc, Mr. Bell has found that many other materials besides selenium are affected by light, faint sounds being audible from the bodies themselves, without the intervention of a telephone and electric battery, when the interrupted beam is incident upon them. Probably these results will need further experiment before they can be finally accepted. For instance, Mr. Bell does not state what precautions he took to prove that the effect was not due to heat, or under what conditions and how often the test was made.

The instructions given in the paper seem to be sufficient to enable anybody to try Mr. Bell's experiments for himself, and doubtless many will soon do so. Without, however, waiting for the results of such experiments, I think we may congratulate him on having at once made an addition to our scientific knowledge, and discovered another possible application of science to practical purposes.

* *The Times.*

Correspondence.

INSTANTANEOUS PHOTOGRAPHY.

Dear Sir,—In a very interesting article on Mr. Muybridge's experiments in photographing trotting horses, in *Land and Water* for September 18th, 1880, page 245, it is stated that some of these photographs were taken in the seven-thousandth part of a second. It would be interesting to know what kind of sensitized plates were used. I have heard of nothing to be procured from English makers of the (so-called) "instantaneous gelatine plates" that will at all approach to this exalted state of sensitiveness. I should imagine it would be quite within the bounds of possibility to photograph an express train, "broadside on," with these plates.

I have a photograph now by me of the "Flying Dutchman," said to be going at the rate of sixty-five miles an hour, taken "end on," on a Fry-plate; but as the train is coming towards you, the apparent motion is reduced to almost a minimum. However, it is a remarkable photograph, as an example of what has already been attained by the gelatine plate.

Mr. Muybridge, it is stated, is intending to pay us a visit, and give lectures and experiments on his wonderful inventions in instantaneous photography, when, no doubt, we shall be more enlightened on the subject.—Yours truly,
Thomas B. Latchmore.

WANTED, A WORD.

Sir,—I fear that Mr. Palmer's suggestion of "model," instead of "sitter," will not pass muster.

Whatever may have been the case in Johnson's day. the term "model" now implies something in the place of and resembling the actual object, and does not apply to the actual object itself. The model of a ship or a statue is not the thing itself; nor can a model be the sitter himself, which would only apply to his bust or statue. The only correct word that I can think of would be "subject;" but this is so unpleasantly suggestive of anatomical or other horrible experiments, that it would scarcely become popular.—Yours, &c., P. C.

APPLYING THE INTENSIFIER WITH A BRUSH.

Sir,—In one of your "Notes" I see you allude to a happy application of perchlorido of iron by means of a brush to a gelatine negative, for the purpose of partially reducing the film where it is too opaque. It may be of interest to your readers to know that I have for some time past employed a converse process, applying bichloride of mercury with a brush for the purpose of intensifying certain parts of a negative. High lights may be put in, in this way, with great facility, and the gelatine film thus treated shows no signs whatever of dodging.

I employ a fine camel-hair brush for the purpose. The negative is fixed and thoroughly washed, and after being well drained is ready to be operated upon. If too wet, the bichloride solution runs; if too dry, the film is somewhat repellent.

I make a saturated solution of bichloride of mercury, and apply this, with the brush, to those portions of the negative that require lighting up; it may be only a slight touch of the brush that is necessary, it may be the treatment of a broad surface. The negative is then well washed, and the ammonia (twelve drops of liquor ammonia in one ounce of water) is poured over the plate. I then wash again.

The amount of intensity to be imparted may of course be perfectly regulated. So even is the action upon the film that it is, as I say, impossible for any one to tell a negative thus treated from one intensified in the ordinary way. Moreover, the process is a very simple one, and any one skilled in retouching can carry it out without difficulty.—Faithfully yours, Francis Dann.

Royal Arsenal, Woolwich, Sept. 22nd, 1880.

Proceedings of Societies.

Manchester Photographic Society.

The ordinary meeting of this Society took place on Thursday, the 9th instant, at the Memorial Hall, Mr. Alfred Brothers, F.R.A.S., Vice-President, in the chair. The minutes of the previous meeting were read and confirmed.

An extra out-door meeting to Worsley was decided upon for Saturday, the 11th instant.

Mr. A. Coventry exhibited a most ingenious shutter, which had the advantage of being used either for instantaneous or prolonged exposures. He next showed some most ingenious apparatus, made and contrived by himself, for use in the manufacture of gelatine plates, viz., a non-actinic lamp, made out of the neck of a pint hock bottle, and a pneumatic apparatus for emulsifying the gelatine, introducing the silver solution in very small quantities, almost in the form of spray, and in connection with which was a stirring apparatus. These were shown in action.

Mr. Robert Atherton said he had used Mr. Coventry's apparatus with the greatest success, and was very much pleased with the ease and certainty of the result.

Mr. W. B. Wood said he had used a very similar apparatus to that exhibited by Mr. Coventry, but did not consider it at all necessary, as he found no difference in the emulsion when made with such apparatus and that emulsified by dropping the silver a few drops at a time, and shaking it after the introduction of each few drops.

Mr. J. Schofield said he had found that, in the preparation of gelatine plates, those which dried quickly were more rapid than others which dried slowly from the same emulsion, and asked if any other member had experienced this peculiarity.

Mr. Atherton said the plates he prepared generally took from eighteen to twenty-four hours in drying, and in his hands they were more sensitive than any of the commercial dry plates in the market. In some cases he had known, a batch of plates had taken as much as forty-eight hours in drying made from the same emulsion, but these plates were not only slower, but defective in other ways, and useless.

Mr. M. Noton then exhibited his instantaneous shutter, introduced between two lenses, which he considered the correct place, and stated that, for instantaneous pictures, it was a mistake to use small lenses, two inches in diameter being the least-sized lens that ought to be used to catch the feeble rays, and made reference to the large bore of telescopes.

The Chairman said the short focus of small lenses was a great advantage, which he hoped Mr. Noton had not lost sight of.

Mr. Coventry, Mr. George Wardley, and others, entered into the discussion, but very few could agree with the great advantage of larger lenses.

Mr. George Gregory exhibited a very beautiful cabinet photograph, taken on a "Swan" plate.

Mr. W. J. Chadwick (the Hon. Secretary) then exhibited and described one of Grubb's new patent stereoscopes, this being universally admired by the members. He also showed one of Dallmeyer's new lantern objectives, a "Meldon" jet for the lime light, and some extraordinary defects in gelatine plates, many that were good negatives having become a dirty yellow colour, and, in many instances, the film had stripped off the glass.

Mr. W. G. Coote next showed three 11 by 9 negatives, taken on gelatine plates, at Haddon Hall, on the occasion of the Society's out-door meeting in August last, and, notwithstanding they were taken in a very heavy rainfall, the results left little to be desired.

Mr. Sefton also exhibited two negatives, taken at the same time and place as those of Mr. Coote, and many members expressed great surprise that such excellent pictures could be taken on so very wet a day.

Mr. Wood then showed some carte portraits, taken on gelatine plates (of his own preparation) with an exposure of two seconds, and a very good transparency on a gelatine plate.

Mr. W. J. Chadwick showed a negative and transparency from the same, which he had taken a short time ago, the exposure being made by his instantaneous shutter. The subject was a sportsman shooting sea gulls. Not only were the gulls shown clearly, but the charge was distinctly seen leaving the muzzle of the gun.

The Chairman said he was very pleased indeed to see the former President, the Rev. Canon Beechey, at the meeting.

Canon Beechey replied to the effect that, though long distance separated him from the members of the Manchester Photographic Society, he watched their proceedings with much interest, often thinking of the many pleasant hours he had spent with the Society, and ever longing to be among them.

After a short discussion on lunar photography, by the Rev. Canon Beechey and the Chairman, the attention of the members was called to the method of voting for the election of officers for the next session, and various suggestions were made, some of which were adopted. The meeting was then adjourned.

Photographic Society of Ireland.

An out-door meeting of the members of this Society was held on the 16th inst., and the exceptionally fine day and large attendance of members combined to make the outing a complete success.

Having met at 9 o'clock at the Broadstone Terminus, a few minutes after, all were on the way to Trim, in the county of Meath, where cars were in attendance to convey the party to the celebrated ruin of Bective Abbey, one of the finest ecclesiastic remains in Ireland. Here a large number of plates were exposed, and the temptation to utilise the old entrance steps for a group could not be resisted. From thence the party drove to Newtown Trim, another centre of ruined churches, silent witnesses of past power and grandeur, with which, unfortunately, the vicinity abounds. After several more plates had been shot off, the remainder of the day was spent at King John's Castle in the town at Trim, where all the remaining plates were exposed. The proceedings ended most agreeably with dinner in the Austrian Arms Hotel, suitable termination to a good day's excursion.

Talk in the Studio.

Mr. Nastrowsky, photographer, 27, and 9, New Bread Street, applied to Alderman Hanson to know what he was to do under the following circumstances. An apprentice who was bound to him for three years, and had been with him about six months, was now anxious to have his indentures cancelled, and in order to induce him (Mr. Nastrowsky) to consent to do so he was systematically destroying a great deal of applicant's property; but last night the culminating point came—two valuable negatives of the Princess of Wales and her daughter were spoilt. They were worth £100. The question was a very serious one for employers of labour. Alderman Hanson asked if the father of the boy was able to pay the damage. Mr. Nastrowsky believed he was. Alderman Hanson said that Mr. Nastrowsky had better consult his solicitor with the view of making the father pay for the son's mischief. The boy (with whom no premium had been paid) promised to behave better in the future.

One Hundred Feet of Picture.—By order of the Lord Mayor, a painting 100 feet long, and 30 feet deep, has been hung in the Guildhall, and will remain on view during the present week. The picture, which contains upwards of 1,000 figures, is a representation of the Battle of Agincourt, and was painted by Sir Robert Kerr Porter (the painter of the Siege of Seringapatam) when 19 years of age, and was, about the year 1819, presented by him to the Corporation of the City of London. It has occasionally been utilized as a screen at the Mansion House, where it has been deposited amongst other civic lumber; but, owing to its immense size, it has been found necessary to cut it into three sections. The centre piece, which is 54 feet long, represents the battle at its height, whilst the side pieces are each 20 feet long. The one on the right portrays the retreat of the French army, whilst the left is a beautiful landscape, with a portion of the English army advancing through a well wooded and watered country to give battle to the foe. As it is impossible to find space for the picture as a whole, a committee has been appointed to consider the advisability of mounting it in sections, and also the desirability of cleaning and restoring it.—*Morning Advertiser*.

Balloon Photography.—The *Daily Telegraph* says:—"An interesting paper on balloon photography, giving a detailed account of the results of some experiments made by M. de Fonvielle in the neighbourhood of Rouen on the 14th of June last, is contained in a recent number of the *Spectateur Militaire*. Two views of the surrounding country were taken during an aerial excursion, from a height of about 3,300 feet, whilst the balloon was travelling at the rate of 20 to 25 feet per second. The photographic apparatus was affixed to the rim of the car on the side opposite to the direction in which the balloon was travelling. Miniature views were obtained of territorial sections about twenty-three acres square, upon which roadways, house roofs, garden walls, hedges, are plainly discernible. Had the sky been perfectly clear, M. de Fonvielle entertains no doubt that every human figure within the scope of the lens would have been distinctly visible in the pictures obtained, and he points out the obvious availability of balloon photography for supplying exact information respecting the dispositions of an enemy's camp and the number of his forces in war time, the operator being safely beyond the range of any projectile susceptible of discharge from a rifle or other 'arm of precision.' The objections to the utilisation of balloon photography for military purposes are at present twain—namely, the rapid movement of the balloon, which interferes with the distinctness of the picture, and the impossibility of steering the balloon so as to impart to it exactly the desired direction. The first of these difficulties M. de Fonvielle alleges to have been already obviated by a mechanical process of Paul Desmarets' invention; for the second, no remedy has hitherto been discovered."

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, "*Photographic News*" *Office*, 5, *Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed* "*Union Bank, Photographic News Account.*"

L.—We fear there is no remedy capable of giving satisfactory results. A reduction has taken place in the body of the gelatine, and any efforts to remove this will act prejudicially upon the image itself.

R. Gordon.—Thank you for your note; we write by post.

Mentor.—"Let him beware who speaks falsely of the sun," is the better of the two, we think. We are very sorry; but some, you know, might have considered it impertinence on our part.

J. J.—1. A bromide plate for the red end of the spectrum, and iodide for the violet. 2. The sun.

Midget.—Surely, if you can stand the plate on end immediately after coating, that is some advantage; you need not, at any rate, have a levelling stand.

Glycerine.—The glycerine is permitted to fall, drop by drop, into nitric acid. The nitro-glycerine may be used in the form of a liquid, as it is, but liquid explosives are inconvenient to handle. For this reason, a siliceous clay is employed as a vehicle, which sucks up the liquid like a sponge; and this mixture is called dynamite.

Experimentalist.—Von Bibra.

Germany.—Waxing would have the effect of protecting the print rather.

Canon.—You will see that zinc gave a better result than iron; for this reason the latter was abandoned in the second experiment.

M. S.—Apply to Mr. Bedford himself, at 326, Camden Road, N. He will doubtless give his opinion on the subject.

Blider.—Why not try Mr. E. L. Wilson's remedy. It is this:

Alum	1 ounce
Water	40 ounces

Dissolve, and soak the prints in it for eight or ten minutes after toning and before fixing. Should the paper show a tendency to crack after mounting and drying, use a weaker solution, or remove the prints sooner from it.

W. P.—The kind of metal does not signify. Lead is most commonly used.

Lens.—Those of good English makers are decidedly the best.

B. B.—Try a yellow glass shade.

N. V.—Yes; in Mr. Hughes' "Manual of Photography."

Hypo.—Thanks for the suggestion.

Cyanide.—You had better make a new bath. We are convinced there is some slight error in your present one.

W. W.—There are many faults in the card sent; one great one being want of sharpness, due, probably, to a movement of the sitter.

S. G.—Your idea is certainly a good one, but we fear too much has already been done with regard to "eminent men's portraits" for you to make it lucrative.

Riveli.—We regret there should have been any delay in returning your parcel, and trust it is now safely received.

M. E.—You will get supplied by any camera maker.

Foy.—Your letter was too late for us to get the desired information in time for this week's impression; it shall receive our earliest attention.

Photo.—Received. Thanks.

Novice.—Refer to "In and Out" of two weeks ago.

H. E.—See letter of Mr. Francis Dann in another column; partial intensification might help you, we think. We are glad to hear of your success. If you want to paint on the back, a solution of albumen might be preferable to varnish; it gives sufficient tooth.

Curator.—The terms are certainly vague, and appear more so on paper than they do in practice; but as both pieces of advice come from eminently practical men, they are worthy of note. Any sized lump of alum would do that is convenient to use, and, during the few minutes of development, sufficient is dissolved to effect the purpose. As to the addition of salt, all that is necessary is to make the water slightly salt, and so long as you do this, the actual quantity is of little importance. We fear it is the *temperature* of your water, rather than anything else, that has caused frilling; during the late hot weather, gelatine workers have met with grave difficulties.

W. K. Burton.—Thanks; in our next.

The Photographic News, October 1, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The American Photographic Convention—Photographs in Natural Colours Again—Asphaltum Photographs—A Photographic Speculation.

The American Photographic Convention.—Our American friends are ahead of us in the patronage and publicity which they give to the photographic art. Would any of the illustrated papers in London think it worth while to give an engraving of the *soirce* in connection with the Photographic Exhibition to-morrow? We fancy not. In America, however, the *New York Daily Graphic* finds the Convention of the National Photographers' Association at Chicago of sufficient importance and of sufficient interest to the general public, not only to present a full-page illustration of the gathering to its readers, but to give a portrait of the Secretary into the bargain. From the representation given in the *Graphic* the gathering must have been large, and the pictures exhibited numerous, though, probably, when allowances have been made for the imagination of the artist, not more so in either case than the annual assembly in Pall Mall East. Of Mr. Copelin (Secretary) the *Daily Graphic* says, among other complimentary things:—"He is imbued with the true scientific spirit, and, unlike some of his brethren, he regards the illustrated newspaper as his ally instead of a rival, as he very eloquently and tersely told the Convention when he announced to them the fact that the *Graphic* would give illustrations of their doings. The *Graphic*, he said, more than the slow weekly illustrated papers, took an interest in photography and in the welfare of photographers. He urged all present to send views of important occurrences to the *Graphic*, as he had done for years. In fact, he spoke of the *Graphic* in terms which the *Graphic* is too modest to reproduce. The members of the Convention agreed to furnish the *Graphic* with all the photographs of everything worth illustrating in its pages, and by unanimous action the *Graphic* was made the illustrated organ of the National Photographers' Association of America." This, no doubt, is one for Mr. Copelin, and two for the *Daily Graphic*; but it nevertheless furnishes a peg on which to hang a moral. In England the complaint is not that photographers do not take notice of the illustrated papers, but rather that the illustrated papers ignore the photographer. In the matter of portraiture, especially, there are hosts of pictures reproduced every year from photographs—the artist, in many cases, finding it unnecessary to alter the pose or the lighting—in which not the slightest notice is taken of the originator. This, we contend, is not fair to the photographer who may have spent time and thought over his picture, sees it slavishly copied (and in not a few instances spoilt), and yet receives no acknowledgment. How many of the portraits of the new House of Commons which appeared in the *Illustrated London News* were copied from photographs, and the originals never even seen, and in how many was the assistance afforded by the photographer recognized? In painfully few instances, we fancy, was the latter the case. This, surely, is not fair!

Photographs in Natural Colours Again.—At last the problem is solved! Photographs in natural colours, a German chemist—it is always a German or an American chemist who makes these marvellous discoveries—has found out, can be produced very easily; indeed, so easily, that it is a wonder no one thought of the process before. This is "how it's done," and please bear in mind, as our friend the conjurer would add, "there is no deception." All you have to do is to spread the "chemical composition" of the German chemist on the surface of a mirror, and give the back part of the latter a coating of oil. The mirror thus prepared is held before the person who is to be photographed. The oil coating evaporates, and the likeness of the person remains in *natural colours* on the surface. "The image so fixed is brought into a bath, and is exposed for a half hour in the sunlight before it is ready for delivery." Wonderful! But what a pity it is that the modesty of this German chemist has induced him to keep his name and address so carefully concealed! We are burning to know something more of this "extraordinary chemical composition," and of this equally extraordinary oil which evaporates and assists in forming the picture. To the ordinary photographic mind this "oil" bears as much relation to the "chemical composition" as Tenterden Steeple does to the Goodwin Sands; but then, in a process which produces photographs in natural colours, everything is possible.

Asphaltum Photographs.—Does anybody know anything of an improved preparation of asphaltum which has lately came under our notice? The process is thus described. A suitable kind of asphalte must be chosen; when powdered it must be a deep chocolate without any tinge of yellow; it must not be soluble to any extent in turpentine, and its melting point must be as high as possible, at all events not lower than boiling water point. A tolerably strong solution of it must be made in chloroform in a good sized flask. When it is dissolved, three times its volume of ether is added, and the whole well shaken; the solution is then allowed to stand for two days. The ether precipitates the sensitive material of the asphalte, and this deposit is collected on a filter, thoroughly dried in the dark, and then dissolved again in benzol. On evaporating upon a plate of glass it leaves a film highly sensitive to the action of light. The image is developed with oil of turpentine and subsequent washing with spirit. In the production of etching on glass, inscriptions on metal by the etching process, as well as for design rollers, the sensitive film of asphalte as a protective coating may always be used with advantage. Mr. Morch has succeeded recently in obtaining by means of this process transparent positives for the lantern; these were copies of the illustrations of various books of travel, and they were found to be specially adapted for this kind of reproduction, on account of their sharp outline. In preparing the sensitive asphaltum for photographic purposes it would be well, perhaps, to separate all the carbonate of lime it usually contains by means of hydrochloric acid before the other treatment. Such are the details as they have been handed to us. We know nothing practically of the working of the process, nor do we know Mr. Morch or Dr. Keyser, the two gentlemen whose names are connected with the experiments. The particulars are certainly curious, and it would be worth while, perhaps, to have some more information on the subject.

A Photographic Speculation.—Here is a warning to fashionable photographers who have a speciality for taking the likenesses of singers, actors, and other public characters. A well-known French baritone had his portrait taken by an equally well-known French photographer, with the object of selling the copies, and being a good-looking fellow he thought he saw his way to make some money. But, unfortunately, notwithstanding his good looks, the public refused to speculate, and the gross of cartes remained unsold. Now, whether the undertaking was a joint speculation on the part of singer and photographer we are unable to say, but the vocalist refused to pay for the unsold copies, and the photographer has accordingly commenced an action against him to recover the money. Of course the whole thing turns upon the terms of the agreement, and should it happen that the photographer has at any time agreed to incur any risk, he will not recover. Any way, the circumstances furnish a hint to those whom it may concern.

A NEW IDEA FOR BACKGROUNDS.

BY L. W. SEAVEY.*

I am sorry to announce to you, ladies and gentlemen, that I shipped from New York a very large box containing some accessories which I had prepared expressly for introduction at this Convention. These cases have not arrived, and I shall

* Read at the Chicago Convention.

have to fall back on my own resources, and convey the idea to you by sketches on this board. A short time ago, a hint was given to me that possibly a new accessory might be introduced, and the idea is briefly this—to take the letters of our alphabet, and represent them by means of profile pieces, such as have been in use. The letters are to be about six feet six inches in height, and represented as if made of the branches and trunks of beech, birch, and other woods of the trees with the bark on, and then to decorate these letters with running vines—the ivy, myrtle, and, perhaps, with the clematis and others, roses, &c. The connection with the subject is simply this.

Suppose that a young lady wishes her picture taken, and her name is Clara; the idea is at once suggested that we use the letter C; and we pose Clara within the letter C. The photograph then becomes what we may term an initial or monogram letter. I will give you a few off-hand sketches, as I have not the letters to show you.

I may as well begin with the first letter of the alphabet. Suppose the letter to be A, and the young lady to be Arabella, and the letter to be terminated with the arbutus (illustrating). I shall not have the time to put the figures in this, because I have some other sketches to make, and it would occupy too much of your time. You see that it is the letter A. The pose naturally suggested is, the figure standing either immediately in front, and the letter forming the background to it; or standing behind, and leaning on the cross-bar of the A. You readily see that the whole letter will admit some very nice positions. The background preferably used for this would be one after the style of what is known as the "Apple-blossoms" reconstructed.

But it is not necessary to have one letter for each, or to have as many letters as there are letters in the alphabet, because we can make letters by using the I as a foundation. You see here is the letter I. Irene would be standing around the letter,—putting her arm around it, as if it was Isaac out late at night.

The first suggestion would be B. We will suppose that is D (illustrating). I have two pieces, joined with a tongue and curve to it, and that forms D. The next letter we would say would be P. That is a piece by itself; a part of letter only, which is added to this foundation stem. The next would be B, and the next would be R.

Many combinations may be made with the I as a foundation. The first would be F; the next would be E; then you can change it to T. You can make five, and sometimes eight or ten letters, with one foundation to start with. C is the foundation for O, which is made by filling in the side; and Q and G. The H affords an opportunity to pose the figure leaning on this cross-bar, or, perhaps, seated on it, in the case of a child. I have some photographs with me which will more clearly and more rapidly illustrate these thoughts.

I think that these accessories have this value—first, they are novel; they give an opportunity to use a great variety of floral decorations; they can be used, if not for the every-day practice of the art, for occasional practice, and especially in making up frames, where you wish to attract attention to your gallery by the novelty of your work.

I will pass on, now, to my other suggestions. These last can be arranged, not only for use in summer, when the decorations would be floral, but in winter, when the letters would be covered with snow and ice. They can also be used for anniversaries of weddings—for instance, 1880, 1492—and that kind of thing.

The practice of sketching from nature—a subject which I shall now commend to you—is analogous to that of photographing from nature. The careful artist, before starting out on a sketching tour, will prepare himself with charcoal pencils, crayon, and so on; but, for rapid work, charcoal is best. Here, however, dry paints, to introduce lights and shadows, come in.

After arriving on the spot, we proceed, first, with the charcoal, and then with the dry paints afterwards; and then, by means of adding a little crayon, we intensify the blacks.

The sketch which I will now give you is one I made on a journey to New York City from the western part of that State. Our train was approaching Canandaigua, and for some reason it stopped on the bridge which spans the outlet of Canandaigua Lake. I was carrying in my pocket a fountain pen; and, after the train had stopped, I noticed there was a good subject for a sketch outside. The train started again in about five or seven minutes. I will now give you the sketch. (Here Mr. Seavey sketched, off-hand, a very beautiful landscape, and was attentively watched as he skilfully proceeded with it.) When finished, he proceeded, viz.:

You will observe the method in which I began. It is analogous to the appearance of the negative in course of development. First, the shadow outline begins to appear, which was the skeleton of the landscape; those fine lines gave me the bearing of the whole picture. The perspective lines carry the eye of the spectator off into the distance—a point which you should carefully observe in selecting the position of your camera. Unfortunately, you cannot chop down all the trees which are in the way; but the artist, with pen and ink, or paper and crayon, can omit these trees, and can also supply a pretty spot of sky or clouds that he has seen, perhaps, a few moments before, or something which he sees soon afterwards

My next sketch will be a very hasty one, representing a novel background for a head. (Here Mr. Seavey sketched a portrait group of two ladies, the second serving partially as a background for the first. It was very effective).

At Home.

MR. PAYNE JENNINGS AT WEST DULWICH.

Apart from Mr. Payne Jennings' rare skill and refinement in the art of making pictures—qualities that few of us can ever aspire to—there is much in his work that may be studied with advantage by every photographer. He has shown in the true spirit of an artist how all-powerful is the pencil of light. He coquettes with pebbly brook and leafy dell, wooing nature under every humour. Now he follows the coy maid into green vale and over purple moorland, now under shadow of deep boulders, beside the rushing foam, now among the yellow-green willows of a placid backwater he makes his capture. Sunshine or shade; the bright lakelet or gloomy cavern; the shadowy foliage of lofty tree, or tender undergrowth of fern and flowret; the black-lichened rock, or snow-flecked clematis; all are tenderly limned upon the sensitive plate, and the sweet pictures thus crystallized for ever.

Mr. Payne Jennings, then, is one of that small band—we might almost count the number on our fingers—who can gather pictures by the wayside with his camera. His pictures (and one can only say this of a very few workers) are published and purchased as pictures, and not as photographs of this spot or that. But as an art-photographer he has done more than this. "Delicacy and brilliancy I believe to be perfection in a photograph," said our host; "and to secure these a light tone appears to me absolutely indispensable." It is to this decided opinion that we owe the new school of printing, for we can hardly call it by any other name, with which Mr. Payne Jennings has made us familiar. Warm tints and delicate tones are no novelty, it is true; but when we have a photographer coming forward who dares to risk the printing of all his work in one particular tint and depth, we must acknowledge that he has courage to back his belief in spite of every prejudice, while the success that has attended Mr. Payne Jennings' publications is ample proof of the correctness of his views.

At Dulwich there is but a printing establishment, and nothing more. Mr. Jennings rarely mounts his own pictures; all his efforts, when not very busy with the camera, are confined to printing; and since he has to supply during the present season some 90,000 impressions for Christmas cards, it may be taken for granted that this work is quite enough to occupy his attention. We all know that Christmas Annuals are written in the summer time, and that the stories of snow-bound travellers that are served up to us every year in coloured bindings in which the holly berry and robin redbreasts prevail, are usually thought out and elaborated in the dog days; but even with this fore-knowledge it strikes one as strange to see photographic printers busy in the hot months upon work that is destined for midwinter sale. Yet here, at Dulwich, in the piping hot sunshine, they are printing away at photographs for Christmas at the rate of a thousand a day. Heaps of prints lie before us, all of that delicate warm tone which Mr. Payne Jennings loves; they are little vignetted land-

scapes, carte size, in sheets of six, and, as we look on, an assistant is hard at work with a pad of felt on the table before her, and a short wooden knife in one hand, smoothing and flattening them, sheet by sheet. Deftly she seizes a curled and cockled print, and puts it, face downwards, on the pad; then, passing the wooden knife edge over the back, working from the centre, she converts the sheet into smooth paper, and gives it a "set," so that the impressions may be piled without difficulty.

What are Mr. Payne Jennings' rules as regards printing? it will be asked. In the first place, he employs a strong sensitizing bath—or, at any rate, not a weak one—never under fifty grains to the ounce; he invariably sensitizes, prints, tones, and fixes in one and the same day, performing the operations as quickly one after the other as he can. He has recourse to acetate toning,* and, as everybody knows, he does not carry the toning too far. He believes that the hyposulphite bath always requires to be neutralised with carbonate of ammonia, and he never employs anything but glazed earthenware in which to wash his prints, since it is not likely to harbour hyposulphite. During the first hour that the prints remain in the washing trough—into which fresh water is continually running—and after they have passed through several preliminary rinsings, they are continually being manipulated by hand, each sheet being turned over and separated, so that they may be perfectly washed.

The paper is very quickly sensitized, and dried: ten minutes will usually suffice for the operation. This is the sensitizing room, and very light and airy it is. The front is of glass, covered with one thickness of yellow tammy; but an additional screen is provided to protect the sensitized paper, and to keep in the warm air, just by the fire. A sheet is floated, drawn as usual over a rod at the end of the bath, and then lifted against the edge, so that it draws with a sucking action, bringing up with it the minimum of solution. The sheet is then blotted against filter-paper, to still further remove the liquid, and is then so slightly damp that in five minutes all superfluous moisture has been driven off. The surface is now rubbed with a soft rag to remove any fibre from the filter paper, and it is ready for the printing-frame. Many might call the paper still moist, but, at any rate, it is not dry enough to cockle. The pressure-frames are set in the shade, and, as all Mr. Jennings' negatives are very thin, the printing goes on apace. Mr. Jennings' paper has a faint roseate hue.

With few exceptions Mr. Payne Jennings prints from reproduced negatives. Indeed, he could only print so many pictures in this way. The original negative is treated as they do the original dies at the Royal Mint; the sovereigns that are coined in large numbers every day are all from the same original engraving; but it is from replicas of this, and not from Mr. Wyon's own handiwork, that the actual striking takes place. Mr. Payne Jennings follows this example. From the original negative a transparency is produced by means of carbon tissue, which, as our readers know, the Autotype Company prepare especially for such purposes. This transparency is usually dense enough without any intensifying; but when it comes to printing a negative from it (also in carbon tissue), reinforcing, to some extent, is necessary. This is done by means of permanganate of potash, the tissue, be it stated, being developed invariably upon thin patent plate coated with a film of gelatine. In this way Mr. Jennings has no difficulty in producing negatives (which are never dense) all of the same intensity, so that he can print half-a-dozen of them at a time in one frame.

Besides the small work, and his large, well-known studies, Mr. Payne Jennings is at this moment engaged in illustrating no less than eighteen different volumes of poems—"all, I am sorry to say, in silver," said Mr. Jennings. "I should much like to employ a mechanical process, or carbon, or platinotype, and I hope sincerely I may soon be able to do so; my only desire is to produce prints as delicately and brilliantly as I can, and, so far as I have seen, none of these processes can compete with silver. I shall be only too happy to adopt them when results as beautiful are to be secured by their means." Mr. Payne Jennings, as a producer of pictures, must please his master—the public; this is the main point he must keep steadfastly in view.

* See our "Topic" in the News for September 17th.

It is curious, by the way, to note that America seems to have been the first to fully appreciate Mr. Jennings' pictures, and the high terms in which they were spoken of at the Philadelphia Exhibition may well be repeated:—"Nothing is more difficult than to describe art, the delicate detail of which is spun out like the spider's web to the finest gossamer thread, and in these pictures you can almost hear the gurgle of the running brook, the crackle of the twigs in the forest, and the music of the summer wind through the leaves. Mr. Payne Jennings exhibited a few of his works at Philadelphia, only a private case, and in the grandest photographic Exhibition ever collected in the world, he succeeded in achieving a distinction which placed him at once in the front rank of his profession. These later works have certainly added to his fame, and England may pride herself in possessing one artist at least who, in his peculiar branch, stands without a rival."

Mr. Payne Jennings, for his camera work, prefers either spring or autumn. Spring in half-leaf is the best time, he thinks; the graceful outline of the trees is seen to advantage, and the wind has less power than upon full foliage. Many photographs, he thinks, are marred by accidental lights; you want broad effects and not lighting here, there, and everywhere. Again, photographs against the light furnish finer contrasts than can be obtained in any other manner; masses of shadow thrown into relief are then secured, and the lighting is much bolder. Mr. Jennings does not think that extra-rapid plates, however useful they may be, will add to the number of our artists; the art photographer rarely wants to work with an exposure of one five-hundredth of a second. He does not care much about depicting express trains going at lightning speed, or four-horse coaches at twelve miles an hour. He is concerned more in obtaining a bit of romance or poetry in his sketches—in depicting a deep-shadowed glen or a sedgy pool in which the yellow water-lilies grow. An old water mill beside the flowing river, forsaken, and in ruins, that lies here on the table, seems certainly to bear out what our host says. It embodies the well-known German ballad of the "Mill-Wheel:"

"In einem kuhlen Grunde
Da geht ein Muhlenrad,
Mein Liebchen ist verschwunden
Die dort gewohnet hat."

And here, perhaps, we may mention, that Mr. Payne Jennings seems always in his pretty pictures to be striving to embody some familiar poem or legend, an effort that possibly has had something to do with the great success which has attended the publication of his work. Here is a picture of the smiling Vale of Avoca, with Moore's lines underneath:—

"There is not in this wide world a valley so sweet
As that vale in whose bosom the bright waters meet."

Here is a shining brooklet in the Dargle, which aptly illustrates Tennyson's well-known lines:—

"I chatter over stony ways
In little sharps and trebles,
I bubble into eddying bays,
I babble on the pebbles."

We cannot help thinking that Mr. Payne Jennings has here found a new vein, and a rich one, too, in photography; and those who can follow in his wake will certainly find both pleasure and profit.

The "At Home" next week will be "Mr. Butter's Photo-lithographic Establishment—the Velvet Roller."

LESSONS LEARNT DURING A MONTH'S TOUR ABROAD WITH GELATINE PLATES.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

THIS was my first season abroad with gelatine plates, and I am astonished how much there is to learn in the best way to manage and carry all requisites for a tour. Thinking that others may perhaps on a future occasion like to take advantage of my experiences, I have thought it as well to jot them down whilst still fresh in my memory. Two years ago I travelled with collodio-bromide plates, and a full kit for wet plates; hence my knowledge then was not what it is now, since the silver bath and all the needful baggage has been left behind. On that tour I made up my mind to have plenty of room for everything, and at the same time made up my mind to pay through the nose for the privilege, as I knew well that railway companies abroad won't carry baggage for nothing. I may at once say that my kit on that occasion cost one half a first-class ticket on all railways, and for making mountain ascents or crossing passes, it cost me the hire of a mule. Before starting this time I said to myself that I would reduce my baggage as far as possible, and as a fact, besides a couple of small Gladstone bags and a necessary great coat, my baggage consisted of a basket, some 1 foot 6 inches long and deep, and about 2 feet wide. Into this basket I packed everything except my lenses, which travelled in my personal baggage. Besides a $7\frac{1}{2}$ by 5 camera by Meagher, which was of the lightest description, I carried half-a-dozen double backs, the whole of them, when charged with plates, not weighing much more than a changing box. Regarding this latter I have at least arrived at a definite conclusion, which I have not up till now been able to do, and that is, that the annoyance of double backs is considerably less than of a changing box, and therefore I adopt them. The camera, slides, extra front, instantaneous shutter, all packed into a leather case *fastened with a lock*, which when full weighs about $14\frac{1}{2}$ lbs,* a weight by no means difficult to carry if one is put to it. In other apparatus I have had, the slides have been carried in a separate case from the camera; but in the present one it is unnecessary, as they are so arranged that a narrow oblong box is formed instead of a square one, and there is no unpleasant bumping of the weight against the legs when it is carried, and no sharp corners dig into the side or back when it is strung over the shoulder.

To finish my description of apparatus, I may say that I carried three lenses, a rapid rectilinear $8\frac{1}{2}$ by $6\frac{1}{2}$, a Dallmeyer landscape wide-angle, and a 7-inch Ross ordinary symmetrical lens, each of which fitted into its own compartment formed in a long leather case with a string to go over the shoulder. The first and last lenses were rarely put into requisition. Out of 64 negatives taken, six were with the first, three were with the last, and the remainder with the landscape lens. It must be recollected, however, that my tour was in Switzerland, amongst the mountains, where only nature's architecture was to be found, in which straight lines are rare. My camera legs are very light, ordinary folding legs on a small triangular stand, on which I have had a four-inch disc of light wood wired in order to save my camera from being scratched, and to give greater stability to it when *in situ*. With these legs, though excellent, I am not quite satisfied; they are just too long when folded to go into my portmanteau. They should be folded in three to do this, and I hope ere another six months have passed to have something which will meet my wants in this direction. I am not ashamed of being a photographer, but it is not customary for a barrister to carry his wig outside his baggage, or a merchant a book of invoices, neither do "artists in oil" carry their paint brushes in an obtrusive manner. So, it strikes me, a photographer should hide his calling till on the scene of operations, and the camera legs are perhaps the only things which give a clue to it. The legs as they are now are wrapped in a focussing cloth, and a pair of straps with a leather handle make all fast. So much for the apparatus.

Plates and their Packing.—Not the least important part of the outfit are the plates, and when these have been selected, the next important point is the packing for travelling. I took eight dozen plates with me, six dozen of my own preparation, and the other two dozen bought plates, one dozen from one maker, and the other from another. The commercial plates I took in their own boxes, and I wish I had not. There are two things against so doing: first, if you undo a packet when away from home you are almost bound to fill your slides with all in it, since the zigzag dodge of separating them almost precludes returning the spare ones into the packet; and, secondly, the boxes in which the packets are packed are usually too tight a fit, except for very experienced hands. It is *more* than an even chance that the corners of the cardbox gives way, and then, where are you? You may wrap the packet up in brown paper, but then all the convenience of a box is gone. For my own plates I had boxes* made $8\frac{1}{2}$ inches by $5\frac{1}{2}$ by $1\frac{1}{2}$ deep, internal dimensions—*not* one of those articles that go to pieces almost when you look at them, but they were made of good stout cardboard with really good edges. The cover was made to fit entirely over the box. The merest fumbler can then make up his packet of plates, and not fear that there will not be room. Would that any words of mine would make those who supply really excellent plates supply equally good boxes for transport! Now, as to packing my plates. At first I tried the late Henry Cooper's dodge of slips of card glued on silk, but I did not like it. I went and saw my friend Mr. England, and he at once showed me what I wanted. He uses little frames of cardboard to place between his plates, and they are just large enough to be flush with their edges. Thus, for my sized plates I cut strips of card $\frac{3}{16}$" wide, $7\frac{1}{8}$ inches long, and an equal number of strips $5\frac{1}{2}$" long. Tough bank-post paper was gummed over with stiff gum, and allowed to dry, and little squares of about $\frac{1}{2}$-inch size cut out. A short piece and a long piece were laid together, or a pair of lines ruled at right angles to one another on a board, and when the square of gummed paper was made to adhere beneath them, and then deftly folded over, two sides of the required frame were made. One more long, and one more short piece, similarly treated, completed the frame; four-sheet card is what Mr. England recommends. When the strips are cut, I can make about thirty of these frames in an hour. The plates are packed alternately back to back and face to face; in the latter case a frame being placed between them. Mr. England deserves the thanks of every amateur for his plan of packing, and I ought to have some share of them for describing it.

My plates were packed in half-dozens, enclosed in two thicknesses of orange paper. The two packets were then enclosed in pieces of black varnished paper, and then placed in the box. Before packing, it is most important that every plate should have a distinctive and *legible* number upon it. In my own case I had two numbers written on two distinct gummed tickets. The one gave the number of the batch of emulsion, and the other the number allotted to the plate. Every batch of emulsion was tried for sensitiveness, and in my note-book the relative sensitiveness of each was duly recorded. In packing the plates, each packet bore the number of the plates, which corresponded to entries in the field-book, of which more anon. By this means the relative exposures could be easily calculated. Each box, I may say, bore a label

* The following are the details of this weight:—

	lb.	oz.
Six empty double backs at 9 ozs.	3	6
Twelve glass plates $7\frac{1}{2}$ by 5, medium thickness, at 4 oz. average	3	0
Camera and extra front	4	7
Strong leather case and top of tripod	3	10
	14	7

The strong leather case is a requisite, since guides and porters have a knack of strapping their loads tightly on to their own backs, or on to that of a mule.

* These boxes were made for me by the Photographic Artists Co-operative Society, and were excellent in many respects.

which showed its contents, and a reference to my field-book enabled me to judge which box to open in order to fill my slides with any particular kind of plate. Now as to the field-book. The one I used was designed by Mr. Paget, and presented to me by him; it is not perfect, however, as I will show. The following is the design, and a couple of extracts from my notes:

Date.	Slide.	Plate.	Number.	Lens.	Stop.	Exposure.	Subject.	Developed.	Remarks.
3/9/80	3	24	17	RR	4	1½	Dent Blanche from Hornli.	5/9	Light G. Time 2.30. Rather OE.
3/9/80	4	42	18	WA	3	2	Görner Glacier from Hornli.	5/9	Light M. Time 3.35. Right exp.

It will be seen that two more columns are required; one for the kind of light, and the other for the time of day. The note-book would then be as under:

Date.	Hour.	Light.	Batch.	Number.	Slide.	Lens.	Stop.	Exposure.	Subject.	Developed	Developer.	Remarks.
3/9/80	2.30	G	24	17	3	RR	4	1½	Dent Blanche from Hörnli.	5/9	E's	Rather over-exposed.
			42	18	4							

Whether a plate is developed or not, it is easy to track it when repacked. The second line shows what kind of information was given in the field-book when an excursion was made. Now 42 was a batch of slow plates, required about a quarter of the exposure of a wet plate; the number of the plate was 18, and found to be in slide No. 4, a fact noted when the slides were filled, the other two numbers being entered before the tour commenced, in order to save trouble. When a plate had been exposed, a faint pencil line was run across the number indicating the slide, showing it had to be refilled, and preventing any small confusion which might otherwise have arisen.

Other Kit Required.—The next article required is something wherewith to light the room in the evenings to enable one to change plates. In one of my works I have described a screen made of cardboard, to be used with a candle; and it is this I should employ again, taking, however, as well, a small sheet of tin to place over the top, in order to prevent the light being reflected from the ceiling. Any small hole is of no consequence, so long as the beam of light does not fall directly on the plate. It requires the light of a naked candle four feet off to act for ten seconds to give a transparency, and it will be manifest that any small beam of light, when reflected (say) ten feet off the plate, and thus diffused, would be inoperative to fog a plate, except with the most prolonged exposure (say an hour) to it. *A dusting brush* is an absolute essential. Plates, however carefully packed, and if left in the slides, invariably have dust upon them; and this can only be avoided by using the brush freely on the night previous to making an excursion.

The screen was covered at first with Thomas's ruby paper, and subsequently with orange paper. I found both an ample protection to plates prepared with iodide, and I cannot say that I have found them less advantageous with the commercial plates I took with me, notwithstanding that, owing to the smallness of the packing boxes, the exposure to the light was more prolonged than with my own plates. I took one dry plate box to hold twenty-four plates with me, but this I should leave behind on another occasion, since, with a few spare frames and one spare card box, it is unnecessary.

Kit for Developing.—I took a small chemical chest with me, about 18 inches long by 1 foot wide and deep. This I should not take again; all I should take would be :—

6 oz. bottle of concentrated pyrogallic acid } Edward's
6 oz. ,, ,, ammonia and bromide } developer
½ lb. of alum
1 lb. of hyposulphite
2 oz. of a 20-grain solution of potassium bromide
2 oz. of a 25 per cent. solution of ammonia
2 oz. of glycerine (useful for sun burns)
1 oz. of pyrogallic
1 oz. measure
1 drachm measure
6 trays
Small ball of string
A sponge
A duster
Gummed paper.

All the above may be packed in a very small box, and ¼ lb. of ferrous sulphate and 1 lb. of neutral potassium oxalate may be taken in addition. A box 10 inches long, 7 inches wide, and 7 deep will hold all of these. Now all the foregoing, camera included, can be packed in a small basket about 18 inches long by a foot wide and 15 inches deep. And it will be found that no damage of any kind will happen to either plates or bottles, so long as they are fairly tightly packed; neither this year nor two years ago had I a single thing in the basket broken. The wicker acts as a spring when porters fling the baggage about, as is always the case. My strong advice is *always to pack your photographic kit in a basket.* This basket dodge belongs to Mr. England—at least, he first pointed out its advantages, and he invariably adopts it. One more thing I forgot, and that is, a 2-foot square of india-rubber sheeting. This is useful during development to save messes on the table, and is utilized in packing to wrap round the boxes of plates to prevent any rain penetrating to them during transit.

As regards the trays mentioned, they take up very little room, and the question comes what kind of trays to take. During my last tour, Mr. Darwin and myself left some ebonite trays to drain on the window-sill, and being forgotten in the morning, by the evening they were nearly as flat as pancakes, through the sun having shone on them during our absence. This prevented some of my friend's pictures from being developed, as he was using larger sized plates than mine; but luckily I had a couple of *papier maché* trays with me, which I then put in requisition. Ebonite are the nicer of the two, since the alkaline solutions dissolve the varnish of the *papier mache*; but I believe tin trays lined with india-rubber sheeting, as adopted by Mr. England, would be better than anything else. Failing these, I should again take out ebonite, but should be careful about the sun. The gummed paper is useful for labelling negatives, and for a variety of purposes (I mended too badly-broken pipes with it most effectually, and thus was able to smoke in comfort till my return home), and should be always taken. If the card frames get damaged, it is at hand for repairs. *(To be continued.)*

THE POLIMERISATION OF VINYL BROMIDE IN THE LIGHT.

M. D. LOOF has examined the influence of different solvents, and of iodine, water and carbon dioxide, on the polimerisation of vinyl bromide (C_2H_3Br) in the presence of light (so-called "photo-polimerisation"). Water, air, and carbonic acid do not interfere with the action of light. Sulphurous acid accelerates it very much. A slight addition of iodine colours vinyl bromide, free from alcohol, rose violet, and stops the polimerisation until the colouration has disappeared through the influence of light; then the liquid darkens in consequence of the separation of the polimer. If a slight excess of iodine is taken, then the liquid is not altered in the light, and remains clear. The iodides of methyl and ethyl prevent the action of the light, in consequence of their own decomposition—viz., the separation of iodine in the light—and the dissolved vinyl bromide remains uninfluenced by isolation for a long time. Aniline also prevents decomposition in the light, but is itself affected, as it turns reddish brown.

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CONTENTS.

ON THE TRANSFER OF THE VISIBLE AND INVISIBLE PHOTOGRAPHIC IMAGE BY SIMPLE CONTACT.

It will be within the recollection of our readers that on a recent occasion M. Laoureux gave an account of a remarkable phenomenon that he had observed. He stated that a gelatino-bromide of silver plate not only preserved the invisible and latent image for a long time on its own surface, but that it also communicated the invisible luminous impression to another gelatine plate. He maintained that it is not even necessary to press the two plates close together; it is sufficient that they are placed parallel to each other, at the distance of about half a millimetre. The undeveloped image is communicated to the second plate, and, when developed, both plates will show images of almost equal intensity.

Captain Pizzighelli has repeated this experiment, but has not been able to produce the same result. He exposed a gelatine plate very fully, and then laid it on another plate which had not been exposed, with an interspace of half a millimetre. After they had been in this position for half an hour, he developed them simultaneously. On the first plate, which had been exposed in the camera, there appeared, of course, the image; but on the second plate no trace of a transferred image was visible. Even when in further experiments Pizzighelli pressed the two plates close together, he found no sign of an image on the non-exposed plate. Hence, he was led to the conclusion that the statement that the image can be transferred from one plate to another by simple contact is erroneous.

As these assertions (respecting the transfer of the latent image and its subsequent development by a *chemical developer*) are so completely contradictory, we may be allowed to call attention to some similar though not so recent statements. Thus Testelin, in his *Essai de Théorie sur la Formation des Images Photographiques, rapporté à une cause électrique*, published in 1860, describes the following experiment in support of his hypothesis, which is, however, not very happily worked out. "A piece of negative paper sensitized with silver iodide, after having been exposed in the camera, was placed in contact with another paper, which had been prepared in the same way, but which had not been acted on by light. The sensitive surfaces of these two papers having been placed one against the other, and strongly pressed together, it became possible, after ten or twelve hours of this contact, to develop on the second piece of paper the image which had been invisibly impressed in the camera on the first. It may be observed that the image obtained on the paper which has been exposed in the camera is always weaker when it has been placed in contact with a second paper, and that it is weaker in proportion as the contact has been longer; further, that, in comparing the relative intensities of the two images, their sum is always equal to that which the image taken directly in the camera ought to have, if it had not been submitted to contact with another paper. Hence it follows that the first image parts with some of its photographic power to produce another. These facts seem to prove that the action of light can be carried out by non-luminous causes, which are evidently due to electric polarisation."

Testelin's supposition that this effect is caused by electrical action is not one with which we are now concerned. Our object is to induce our readers to try for themselves whether the latent image can be transferred by contact only. Further, whether the image thus transferred can be brought out by the chemical developer (silver bromide plates, with alkaline pyrogallic, or ferrous oxalate), or by the physical developer (acid pyrogallic, or iron solution with some silver nitrate).

It may be that under certain circumstances there may occur, in the case of gelatino-bromide of silver plates, that continuance of the luminous action of which Blow speaks. According to this observer, the latent image becomes more vigorous by keeping the plate in the dark, and allowing some time to elapse between exposing and developing; but we must acknowledge that this opinion of Blow's is in opposition to that of all other experimenters. If, however, it should be true—although it is by no means yet proved—that the latent image can be carried over to another film of silver bromide, it is not impossible that the same action should be continued deeper into the body of the original film, as in the case of a bichromate impression. From this we can see how far we may be carried by the theory of the possibility of transferring the latent image by simple contact, though, we repeat, this theory is, as yet, by no means proved—at least, in the case of silver bromide.

There is, however, no doubt that a visible image, taken on albumino-chloride of silver paper, can be copied on to another similar paper in the dark by simple contact. All the experiments showing this belong to the same category as that which Niépce de St. Victor described (more than twenty years ago) as an unknown property of light.

If a recently-printed picture on albumenized paper be laid in the dark, on a sensitive albumenized paper, there will be gradually produced on the latter a weak print of the former. It has also been known for some time that, when a negative is copied in the printing-frame on salted paper, the back of the latter, from an unknown cause, undergoes some change, so that a fresh salted paper placed on it will receive a weak impression of the image, even though the original negative should have been removed from the frame. Though this phenomenon has often been observed, it is not always easy to succeed with the experiment.

It is also well known that an engraving or print, when pressed against a piece of sensitized paper, will gradually blacken the latter, and that the parts not covered with printing or engraving will generally produce a deeper black than those that are so covered; also, if the printed paper has been previously exposed to the light, it will have a more energetic action.

A further instance of the same kind is that stated by Malone, in 1861. He took a sheet of paper, dipped it in a solution of silver nitrate, and placed it in the dark over a printed paper which had never been exposed to the light: on flowing gallic acid over it, a weak positive was developed, and this, after drying, appeared negative, by transmitted light. In this case there was no question of the action of light, so that the phenomenon cannot be explained by phosphorescence as Niepce supposes.

The fact that a more intense image can be developed on certain parts of dry plates when they have been wrapped in printed paper belongs to the same category. In these two last-mentioned experiences, however, the results may, perhaps, depend on the formation of reducing vapours which condense partially on the surface of the plate.

In methods, however, of producing images by contact,

and by simultaneous action of the developer, it seems most probable that an electrolytic decomposition comes into play. Abney's experiment is well known; if a developed negative—one, that is, consisting of metallic silver—is coated with an emulsion of silver bromide, and is then treated with a developing solution, the bromide over the parts forming the image is reduced to metallic silver, without having in any way been acted on directly by light, and the negative is reproduced on the secondary film by contact only. Eder also mentions an experiment bearing on the same point; he took a pure silver wire, laid it in the dark on a film of silver bromide, developed with ferrous oxalate, and found that where the wire had touched the film, the bromide had been reduced. In this way he explained the fact so often observed that, in the course of developing, the reduction of silver bromide penetrates through the film and ultimately reaches the glass plate. Now, if the film be a very thick one, it is impossible that the light could penetrate so deeply; the cause of the reduction can, therefore, not be photo-chemical.

From the cases which have been here described of the reducing action in photographic plates, it will be seen that the photographer is often liable to meet with similar results. Generally such reduction acts injuriously on the formation of the normal image, and causes spots and faulty outline; sometimes, however, it acts in the same direction as the light itself, and assists the work of the photographer. At all events, care should be taken to ascertain the cause of this fickle phenomenon whenever it presents itself, and in this way the operator will guard himself against being taken unawares.

BROMIDE OF SILVER.

We have been favoured by Mr. A. J. Jarman with a tube of bromide of silver which he has recently prepared for gelatine workers, and, so far as our experiments have gone, the results are certainly satisfactory. The film is clean and transparent, and the image full of detail; the only fault we have to find is that the plates rather lack density, a shortcoming that was, however, to be overcome in a great measure by permitting more of the material to set upon the glass.

The bromide was received in a tube carefully packed in yellow paper: it was moist and pasty to the touch, and was evidently in admixture with some colloid substance. One advantage was its simple use, for in half-an-hour the mixed gelatino-bromide was ready for coating. Some gelatine (Nelson's best quality) was put to soak in water in a flask, and a little of the water subsequently introduced into the tube to rinse out the prepared bromide, the operation, as a matter of course, being conducted in the dark room. Both bromide and gelatine being now contained in the flask, this was heated by immersion in hot water. The flask was shaken constantly to effect the dissolution of the gelatine, and to bring about a perfect mixture. Alcohol to the extent of ten per cent. was then added, and, after filtration through muslin, the emulsion was ready for use.

It will be seen, therefore, that the preparation of gelatine emulsion is shorn of much of its tediousness and difficulty by using already prepared bromide of silver, and, if only a vigorous film can be depended upon in every plate, photographers will doubtless be pleased to avail themselves of this new commodity.

Notes.

The soirée to inaugurate the Photographic Exhibition takes place to-morrow at 8 p.m., at the Gallery, 5, Pall Mall East. The Exhibition opens to the general public on Monday.

Complaints are still rife on the subject of the black pigment upon panel or promenade mounts, the destructive action being observable, strange to say, only in a certain class of the more highly finished boards. At our request, Mr. Spiller has kindly undertaken an examination of some good and bad cards, and we will place his report before our readers as soon as it reaches us.

Mr. Sumner Painter, it appears, shares with Professor Graham Bell the honour of inventing the photophone. Not only selenium, but other substances—such as ivory, celluloid, gutta-percha, india-rubber, wood, mica, &c., besides many of the metals—are sensitive to light vibrations, and are shaken when an intermittent beam of light strikes them. In the experiments of Bell and Sumner light and electricity appear to be transformed into one another, or, at any rate, it is difficult to say with which phenomenon one is dealing during certain phases of the operations.

Professor Bell very clearly describes the main points of the photophone in his lecture. He says:—"We find that when a vibratory beam of light falls upon these substances they emit sounds, the pitch of which depends upon the frequency of the vibratory change in the light. We find further that when we control the form or character of the light vibration on selenium, and probably on the other substances, we control the quality of the sound and obtain all varieties of articulate speech. We can thus, without a conducting wire, as in electric telephony, speak from station to station, wherever we can project a beam of light.

A sad occurrence took place in a photographic studio last week. Whilst in the act of having his photograph taken, the Rev. E. P. Blunt, rector of Spetisbury-cum-Charlton, was seized with a paralytic stroke, and expired. The deceased was aged 75.

Photography has for some years past been recognized as a "special subject" for study at the Staff College, Sandhurst, and now there is a prospect of its introduction in a like manner at the Royal Naval College, Greenwich.

In the case of the Sandhurst College, it is in the power of any officer who is undergoing the course of tuition to take up photography, a knowledge of which is regarded by our military authorities as especially useful to officers on the staff. In rapid reconnoitring, military surveying, and mapping generally, the camera will doubtless afford valuable assistance, while at the same time supplying the commanding officer with a ready means of illustrating his despatches. Dr. Atkinson, F.C.S., the professor of chemistry at Sandhurst, conducts the photography classes.

Some years ago Mr. Baden Pritchard contrived a small photographic apparatus for reconnoitring service, to be carried in a leather case no larger than that in which the staff officer carries his field glass slung across the shoulder. By its means an officer could secure a view and be in the saddle again in two minutes. With the gelatine plates now at our disposal, a reconnoitrer of this description could be employed with even more speed and certainty.

The Artotype process, which is being so extensively worked in America, and which is one of the many modifications of collotype, owes much of its success to the teaching and training of Obernetter, of Munich, one of the most advanced photographers of the day.

Everybody has admired the examples of heliogravure produced now-a-days by MM. Goupil et Cie. ; but it is not generally known that they are all finished by hand-engraving. Four engravers of the highest class find constant employment in the Goupil establishment, touching the blocks produced by means of Woodburytype, and the modification of it elaborated by M. Rousselon.

M. Rousselon, by the way, who has done so much in the Goupil establishment to work out a practical photo-engraving method, has, *on dit*, worked out a fortune at the same time, and retired into private life to enjoy it.

"Couldn't you get a better expression than that?" we asked. It was a most disagreeable portrait of a man between forty and fifty, with lower jaw protruding, and a glum, settled look about his face that impelled you to cry out, "Come, cheer up!" The photographer shook his head: "Impossible; he is one of your 'compulsorily retired' men from the army."

A happy suggestion has been made to employ luminous paint for the lighting up of coal mines, and thus avoid, in some measure, the use of lamps in dangerous pits. The idea is to have a broad, endless band of canvas or similar material travelling over rollers, the surface of the canvas being covered with luminous paint. At one particular spot an electric light is fitted, and this renders luminous the moving band, which, every time it passes by the light, has its illuminating power revived.

When gelatine solution and glycerine are mixed together they do not combine in the ordinary sense of the word, but form a sort of sponge. The gelatine, when it sets, is not suffered to contract, but its structure and pores remain open, and, although dry to the touch, it is in a much better condition to absorb a liquid. For this reason gelatine plates containing glycerine would be capable of being acted upon far more quickly by the developer.

An actress in New York, the other day, on the occasion of her benefit, was, we are told, "considerably startled by some one dropping at her feet from one of the side boxes—not himself, but—a huge and weighty parcel, which turned out to contain a finely-mounted album." It is not stated whether the album was filled with portraits of the fair *bénéficiare*, or with those of her admirer, but the presentation in this rough-and-ready manner caused such a stir in the house that the donor is likely to accomplish it by some more quiet way in future. The story calls to mind that of the French *provençal*, who argued that he had a right to throw flowers on the stage, if he chose; and who was told, in reply, that it was not so much the flower he had thrown, as the flower-pot, to which objection was raised.

FRENCH CORRESPONDENCE.

The Condition of Photography as a Commercial Undertaking in Lyons—Experiments which have been made there with Gelatino-Bromide—The Electric Light for Taking Portraits—A Photographic Cheap-Jack.

Photography at Lyons.—On my return from the South of France to Paris, I broke the journey at Lyons, in order to ascertain what photographic work is being done in the second city of this country. As the result of my visits to all the principal studios of the city, I have been particularly struck with the absence of any business for producing photographic prints on a commercial scale; that is to say, there is no house working, in any way, photo-collotype, or the Woodbury process, or photo-engraving, or even photo-lithography. In an industrial centre like Lyons one would expect to find all these processes being worked as commercial undertakings, and one cannot but be surprised at the deficiency. I was told by some people that the elements are not favourable to this class of work, but the elements are, I think, only wanting because of the absence of workshops where it could be carried out. M. Quinsac, of Toulouse, for instance, though much less favourably situated, has succeeded in obtaining very important work of this character, to be executed even for houses in Paris. It is therefore not work which is wanting at Lyons, but the means of executing work.

Gelatino-Bromide Processes at Lyons.—As is my custom, I made, too, in the city as complete an investigation as possible of the condition of the gelatino-bromide processes there. I find that the process is much pursued by amateurs, but has been entirely neglected by professional photographers. They have all had an opportunity of trying it, but when they have failed, they have been quick to proclaim the process itself as of no advantage for their own style of work. Not even among the most able photographers of Lyons, who were in a position to try the gelatino-bromide, did I find one that had done so more than very superficially. It is certainly not in this way that any one of them will arrive at a position when he can pronounce a judgment on the excellence of the process, and I did not hesitate to point out to them that no one should attempt to appraise the value of a method without at least knowing something about it. Among amateurs, however, who are tolerably numerous at Lyons, I find the process in full swing, and it seemed to be highly appreciated. M. Garcin manufactures plates 13 by 18 centim., which he sells at the rate of 4·50 francs the dozen, or even cheaper; this extraordinarily low price ought surely to tend to popularise the process. The plates of M. Garcin are made one at a time by hand, and this renders their cheapness even more surprising. It is true that, to meet the demand, M. Garcin, his wife, and children are hard at work making plates from seven to half-past eleven o'clock at night, and they turn out about 600 every day; this may, perhaps, explain the reasonableness of the price.

The Electric Light in Photography.—M. Vander Weyde's patent is at Lyons in the hands of M. Lumière. Appropriate as the name may be, this experienced photographer could not rest without possessing the means of producing his portraits by aid of the electric light, although in a place like Lyons, where any new invention is immensely long in getting established, the experiment was risky enough. M. Lumière's arrangements are very complete, but they do not, perhaps, as yet give all the results that might be expected of them. The expense entailed in fitting up the apparatus for a process of this kind is considerable, and it is difficult in a provincial town, once the fashion is over, to make it pay. But in saying this, with regard to the actual case of which I am speaking, I am, perhaps, actuated solely by the interest which I feel in the success of M. Lumière's experiment. In other respects, I have reason for hoping that he will never regret having placed himself in a position to dispense with the services of the

sun in a city so celebrated for its fogs. Only I wish that M. Vander Weyde could find a means of improving his reflector, so as to soften the effect of the radiation, which is often dazzling to weak eyes; it seems to me that there ought to be no difficulty in effecting this. When I first saw the electric light in M. Liébert's atelier at Paris, I was struck with the necessity for some improvement in this respect. One of the first requirements of an artificial illumination is that it should be capable of being endured; M. Liebert should in his own interest make experiments with the object of removing the difficulty, and I hope he may be successful.

A Photographic Cheapjack.—Some months ago a curious photographic event occurred at Lyons. An itinerant photographer, one of those who is in the habit of frequenting country fairs, took it into his head to set up his van in one of the busiest parts of the city; he duly armed himself with a permit from the Mayor to take up his quarters in this place for three months, and advertised that he was ready to take the portraits of any customers at the price of 4·80 francs the dozen, carte size. The low price proved such an attraction to the good people of Lyons and the neighbourhood, that the mountebank—I beg his pardon, the photographer—had as many as nine hundred visitors in the course of one day. Suddenly, the established photographers, who had to pay their rent and their licence, found themselves losing their business, and they had to petition for the expatriation of this cheap-jack. He was at liberty, they said, to charge as low a price as he liked, but he ought not to be allowed to have the free use of a public place, which belonged to all the citizens. They succeeded so far that the municipal authorities refused to renew the permit, and our friend was obliged to move himself off. On his arrival at Dijon, he tried the same game, but the professionals of that town, warned by one of the sufferers of Lyons, were too quick for him, and he was not allowed to set up his shop in a public thoroughfare. It seems that the shock received by the photographic fraternity in Lyons has been a rude one. With the exception of MM. Victoire and Lumière, and perhaps a few others who have a select and constant *clientèle*, the photographers experienced a melancholy succession of empty waiting rooms. This is quite probable, since the itinerant establishment did business for no less than 150,000 francs in three months—no small sum. The work produced was, of course, of a most inferior character, but there was enough for one's money, provided it was not looked at too closely. This example of the way in which our art may be prostituted is not likely to add to its credit; at the same time, it is curious, if not interesting, to note this tendency to low prices, which may little by little induce a greater spread of photography among the masses. At present it would not be right to lower our prices, but perhaps, owing to the introduction of improvements, the day may come when it will be better to do so. This, however, we can do, without forgetting that the authorities of Lyons had no right to place a public place at the disposal of one person to the detriment of others of the same trade, who have to pay for their licences. No manufacturer would be safe in a competition of this description, unless equal rights are maintained for all. Leon Vidal.

Topics of the Day.

ON SCIENTIFIC ACCURACY IN INSTANTANEOUS PHOTOGRAPHY.

BY J. VINCENT ELSDEN, B.Sc (LONDON), F.C.S.

Apart from the popular interest attached to the novelty of photographing objects in motion, and the advantage, from an æsthetic point of view, of the extensive opportunities which instantaneous photography affords of more accurately picturing the activities of nature and art, extra rapid photography has a still greater utility from a scientific aspect.

Although, in the still early days of extreme sensitiveness, it would be impossible to predict to what special scientific uses instantaneous photography may yet be brought, there is one consideration which will, in every case, be of the first importance, and upon which will chiefly depend the extent to which it can be employed. Unless the strictest accuracy can be obtained, we can scarcely hope that rapid photography will ever be of much scientific value, or that it will rise higher in the estimation of men of science than to be considered an amusing pastime or a popular curiosity.

For the purpose of obtaining both rapidity and ease in quick exposures, numerous contrivances have been proposed, and such perfect results obtained as to justify the expectation that it will not be long before the pictorial photographer will have accomplished the full extent of his ambition. But at this time the question naturally arises as to whether any of the proposed complicated mechanisms really produce those results which are important in work where the greatest accuracy is essential, and where minute displacements of the object have to be considered. So far as freedom from vibration and facility of effecting exposure at any desired moment go, many described methods seem to promise all that can be desired; but still there seem to be wanting two important points: a more absolutely instantaneous movement, and, above all, a simultaneous exposure over all points of the object. The importance of the latter point for scientific purposes is undoubted; but it has been completely overlooked up to the present, owing chiefly to its small importance in ordinary photographic work.

The principle which has been perhaps most fully worked out hitherto is that of the drop shutter, whereby an aperture is made to pass quickly over the opening of the lens; but I described, a short time ago, a method of reducing this exposure one half by the simple plan of allowing two apertures to pass one another in front of the lens.*

If rapidity is the object sought, it follows that such a plan is more desirable than one which takes twice the time. But by far the most important advantage of the method described by me consists in the fact that such an arrangement gives a simultaneous exposure over all points of the picture; whereas the drop shutter creeps gradually over the aperture of the lens, exposing successive portions of the plate one after another. It is only by causing exposure to begin and end in the centre of the lens that a strictly correct instantaneous picture can be taken; and it will now be endeavoured to show how, in this respect, the drop shutter is inferior to the "simultaneous" shutter.

For the sake of being perfectly general in the following remarks, it will perhaps be more simple if we express by mathematical symbols the different quantities which will enter into the consideration, especially as this method will allow a complete independence of variable quantities, such as the size of aperture or duration of exposure. Expressing the rate of fall in inches per second by x, and the size of the aperture by $\frac{y}{2}$, we see that a drop shutter must fall through a distance y to give a complete exposure, and would take $\frac{y}{x}$ seconds to fall this distance, the motion being assumed uniform throughout. If we now consider a small portion of the aperture of the lens, at the top, having a depth m, the shutter takes $\frac{m}{x}$ seconds in passing over it, and by the time it has fallen a distance equal to the width of m and the aperture together, the exposure of this portion of the lens is finished completely. But this happens in $\frac{y}{2x} + \frac{m}{x}$ seconds; and hence that part of the picture remains in darkness during the remainder of the exposure, which is $\frac{y}{x} - \frac{y+2m}{2x}$, or $\frac{y-2m}{2x}$ seconds. This fraction is $\frac{y-2m}{2y}$ of the whole exposure, and leads to this result, that, *in the drop shutter, any particular portion of the picture is in complete darkness during* $\frac{y-2m}{2y}$ *of the whole exposure.* Now, if m be infinitely small, this fraction becomes $\frac{1}{2}$, and shows that, conceiving the plate to be

* See Photographic News, vol. xxiv., p. 364.

made up of an infinite number of mathematical lines, *each line is only exposed during one half the total exposure of the picture*, and the smaller we make m the nearer will the fraction $\frac{v+2m}{2v}$ approach its limiting value $\frac{1}{2}$. It can also be shown that, if a portion of a depth m be also taken at the bottom of the lens, this portion will begin to be exposed $\frac{2m}{x}$ seconds before the upper portion, of the same depth, is in complete darkness. Hence there is a moment when the whole lens is simultaneously exposed; but since this only lasts during $\frac{2m}{x}$ seconds, and since m, for any given point, is infinitely small, it follows that *the duration of this simultaneous exposure is almost insignificant in comparison with the total exposure*, and a movement might take place, when just half the exposure is complete, in the top and bottom parts of the object, which might cause either blurring or a duplicate image. To test this, the following experiment was tried :—Two white laths were fastened, by a pivot, on a black board, and kept strictly parallel by strings, which could also cause them to move quickly around their pivots, while still remaining absolutely parallel, as in fig. 1. Photographs of these in

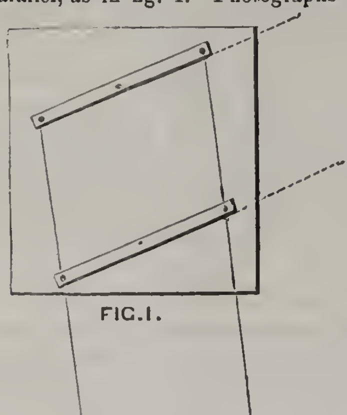

FIG. 1.

motion, by means of a drop shutter, could often be made to show a marked want of parallelism, even when there was no apparent blurring of the image, as in fig. 2.

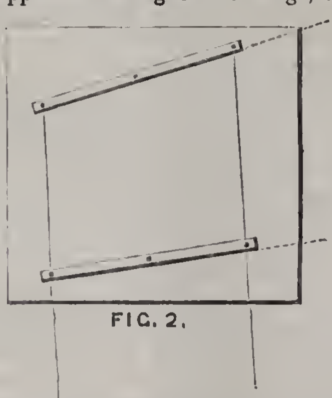

FIG. 2.

This is easily explained, if the motion is a quick one just at the moment when the upper lath is in darkness, and the lower one has scarcely begun to be exposed. The "simultaneous" shutter invariably gives parallelism, and, in the case of too rapid a motion, detects the movement by blurring of the image. Hence we see that, even in the case of a moving body of which all the parts are in rigid connection, a drop shutter may give results which are deceptive and inaccurate.

But if the moving objects to be photographed are independent of one another, the failure of the drop shutter is still more possible. Suppose $a\ b\ c\ d$ to represent a negative exposed on objects moving independently of one another. All objects situated in a portion $a\ b\ e\ f$ were left in complete darkness during $\frac{v-2m}{2v}$ of the whole exposure, m being the width of $a\ b\ e\ f$; and all objects in the portion $c\ d\ g\ h$ were in darkness for the same length of time before their exposure began.

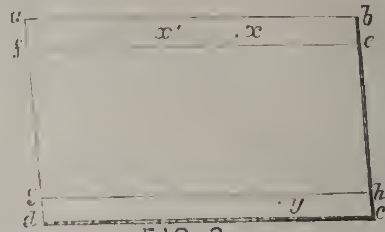

FIG. 3.

During these periods of darkness, all kinds of motion may have occurred; and the negative taken with a drop shutter may give an apparent relative position of any two points in the top and bottom portions of the plate, which is far from their actual relative position. Thus, by the time the exposure of a point y is finished, x may have moved to x', and their relative positions completely altered; and yet perfectly sharp images of x and y may be retained, although in false positions. In fact, x and y may be represented on the negative in relative positions which never really occurred.

This mistake could scarcely occur with a "simultaneous shutter," which, if quick enough, would give their true positions, and if not, would show, by blurring, that movement had taken place.

These examples will be sufficient to show that any arrangement for taking an instantaneous view, which is not at the same time simultaneous, may be very far from correct. Although the object must have once occupied the position marked by its image, it may be in a very different situation before other objects are impressed. However unimportant in ordinary work, this is a point to be remembered in all cases in which any importance is attached to securing a photograph of an object as it really is, and not as it might appear if looked at in successive portions separated by an appreciable interval of time.

The "Topic" for next week will be, "A Drying-Closet for Gelatine Plates," by William Bedford.

Correspondence.

DRY PLATE WRINKLES.

Dear Sir,—No doubt many dry-plate workers are troubled at the present time with frilling of negatives. To those who are so troubled, I can offer a remedy which I have found to completely cure that evil, so far as saving the negative, which otherwise would be worthless. The *modus operandi* is simple and certain: wash the negative, and drain for about ten minutes; now take a piece of gelatine transfer paper, slightly larger than the negative, wet it well, place it gradually down upon the gelatine film, hold it firmly at one end; now take a knife, and scrape the blade of it along the paper until all frills are completely squeegeed down again; let it rest a few minutes, raise one end, and strip the paper gradually off the negative; it will then be found safe and sound.—I am, dear sir, yours truly,

C. Harris.

STOPPING DOWN LENSES.

Sir,—I have read with much satisfaction your sensible remarks on "the stopping down of lenses." I would add a few words to what you say, which I shall be glad if you

will publish, because I think it is impossible to impress too strongly on photographers the disadvantages of trying by the excessive stopping down of portrait lenses to make them cover a larger plate than they were intended for.

There is naturally a greater tendency, since the introduction of gelatine plates, to resort to the practice, because these are so sensitive that the stopping down of the lens, and its consequent comparative slowness, does not unduly protract the sitting.

The effect of using a lens with too large a plate, or, in other words, of using a lens of too short a focus for the plate, is not to produce actual distortion, but to make the point of view too near for the size of picture, giving it the appearance, when looked at from a reasonable distance, of having all the parts which have been nearest the camera very much exaggerated.

I find it an excellent rule with portraiture never to attempt with any lens to cover a plate whose length is more than one-half the equivalent focal length of the lens —this without regard to whether the lens is a portrait lens, a rapid rectilinear, a rapid symmetrical, or a view lens. For example, for a half plate I use a lens having at least 13 inches equivalent focus for a whole-plate 17, and so on.

It must be borne in mind, however, that, in bringing the camera nearer, to take in a less portion of the sitter—"model," it is to be for the future, by the way—such as, say, head and shoulders only, the focus is much increased. The consequences are that a lens may be used for a larger plate when used for head and shoulders only than for full length, either sitting or standing.—I am, sir, yours, &c.,

W. K. Burton.

RELICS OF OLD LONDON.

Sir,—I am glad to find, from a paragraph in your number of the 3rd. inst., just shown to me by Mr. Dixon after my return from a holiday, that you are interested in the subject of photographing "Old London." Mr. Dixon has, no doubt, said enough to remove your impression as to the want of activity of the Society for Photographing Relics of Old London, but you will perhaps permit me to add a few particulars. The Society originated in 1875, in the desire of a few artists and lovers of the picturesque to secure a record of the Oxford Arms Inn, Warwick Lane, then threatened with demolition. We took all practicable means of making known our project, and met with so much support, that it was determined to make these photographs the commencement of a series, and they consequently appeared as the first year's issue of the Society. To enable us to keep pace in some measure with the work of destruction, the issue was doubled in 1879, and twelve photographs are now published annually. The Society have issued in all forty-eight views, and negatives for next year, consisting for the most part of views of the Southwark Inns, have been taken. All the past numbers, and some of those for next year, will be found at the forthcoming Exhibition.

I have now before me a list—the length of which would, I believe, surprise most of your readers—of interesting remains of "Old London," and I am endeavouring from personal inspection, and with the assistance of friends, to extend and complete this. So far as is possible, we keep a watch on these subjects, and on the first symptoms of danger secure as many negatives as may be thought desirable. Thus, among numerous negatives taken in advance are those of Zion College and Oxford Market, both either demolished, or in course of destruction. Photographs issued by the Society of buildings since destroyed are those of the Oxford Arms—by far the most picturesque of the Old London Inns—Temple Bar, houses in Leadenhall Street and Grays' Inn Lane, and the so-called "Shakespeare's House" in Aldersgate Street. The Society now number sufficient subscribers to give us the hope that the work may be carried out with a fair approach to completeness.

The smoke of London, the narrowness of the streets in many cases, and the ceaseless traffic, often create great difficulties. Almost every subject requires to be taken at a particular hour, some even at a certain time only of the year. Mr. Dixon has, however, shown the greatest skill and perseverance in overcoming these obstacles, and I believe that the results will be admitted to be very successful. The new dry plates admitted of the issue of views of interiors in the Charterhouse.

Allow me to say, in conclusion, that I shall at all times be most happy to give to any enquirers information as to the Society.—Your obedient servant, Alfred Marks.

Long Ditton, Surrey.

THE PAGET SHUTTER.

Dear Sir,—Mr. Paget, in his description of his instantaneous shutter, has adopted the same principle which I advocated in mine, viz., a long aperture, and a quick motion over the front of the lens. In justice to Mr. Paget, it should be stated that he talked the matter over with me, and I believe it is from him that this modification of the ordinary drop shutter springs. In my hasty description I omitted to state this.—Yours faithfully,

W. de W. Abney.

WANTED, A WORD.

Dear Sir,—Your correspondent, "P. C." objects to the word "model," proposed by me to replace that of "sitter," as applied to portraiture, and suggests instead the word "subject," thinking it more correct; and yet, after having proposed it, it fails to satisfy him, for he says he fears the word will not become "popular" in consequence of its being suggestive of "anatomical and other horrible experiments." I contend, sir, that he is entirely in error, and I fail to see the force of his gloomy anticipation. We are all "subjects," and loyal ones, too, I hope! Even taken in this sense, for instance, it utterly fails to call to mind "horrid experiments" in dear Old England, since the rack and other devilish instruments of torture have given place to the glorious institutions which we happily enjoy and appreciate; and may God protect them for ever! To take the word in another phase, and the one "P. C." means, it is equally the *wrong word*—to employ the word "subject," I mean, in place of "model."

The word "subject" would be right only when taken in the following sense. Let us suppose that we intend to make a "subject" picture, the title of which shall be "The Age of Innocence." We take for our "model" a beautiful, fair-skinned, blue-eyed child with golden hair, whose smile is so captivating that every one who looks upon the picture exclaims, "What a splendid 'subject'! And to produce this splendid effect, the sweet child was our "model." I repeat, there is no other word known that can possibly displace "model" from its *true position*!

I quite agree with "P. C." that the model of a ship is not the ship, and also that a sculptured bust is not the original model; it does not require a genius to tell us that; but, sir, I contend that both are "models"—the life-model and the sculptured one, from both of which, photographs can be taken. Sir Joshua Reynolds, the eminent first President in the Royal Academy, in a discourse addressed to the students on December 10th, 1782, uses the word "model" in precisely the same sense as I propose it (*vid* "Reynolds' Discourses, page 44)." We cannot entirely refuse to Titian the merit of attending to the general *form* of his object, as well as colour, but his deficiency lay—a deficiency, at least, when he is compared with Raffaelle—in not possessing the power, like himself, of correcting the form of his *model*, by any general idea of beauty in his own mind. Of this, his St. Sebastian is a particular instance. The figure appears to be a most exact representation, both of the form and the colour of the *model*, which he then happened to have before him; it has all the force of nature

and the colouring is flesh itself. But, unluckily, the *model* was of bad form, especially the legs. If, sir, "P. C." is not convinced after this, "neither would he believe, though one rose from the dead"!—I am, dear sir, very truly yours,

H. E. Palmer.

Proceedings of Societies.

Bolton Photographic Society.

On Saturday, the 11th inst., the Bolton Photographic Society held their annual outdoor meeting at Myttou Hall, the residence of John Hick, Esq., President of the Society. A portion of the members left Bolton by the 9.45 a.m. train to Whalley, the remainder proceeding in the afternoon. After a very pleasant morning at Whalley, several views of the Abbey being taken, the party proceeded to Mytton Church to await the arrival of their friends before proceeding to Mr. Hick's. The expected portion having arrived, a movement was made towards the hall, where the secretary and several gentlemen were introduced to Mr. Hick. After the party had partaken of some refreshment,

Mr. Rideout moved a vote of thanks to the host for his hearty reception of the company, and expressed the honour the Society felt in possessing that gentleman (Mr. Hick) as a member.

Mr. Howarth having duly seconded the motion,

Mr. Hick, in reply, expressed his pleasure in meeting them, and trusted they would all enjoy themselves and be successful in their photographic endeavours during the afternoon, and hoped, now he had more liberty, that he would be able to meet them now and then in Bolton during the coming session.

An adjournment was then made to the terrace behind the hall, where a photograph was obtained by Mr. Parkinson of the members present, including the president, &c. The gentlemen dispersing, views were taken of the hall and the river adjoining, the day turning out very favourable for photographic purposes. A substantial tea was provided by Mr. Hick at six o'clock, and having been duly disposed of, the party made towards Whalley, their cameras and other baggage being forwarded for them by the kindness of the president, leaving Whalley at 8.40, and arriving in Bolton about 10.30 p.m., after having spent a particularly delightful afternoon.

Talk in the Studio.

South London Photographic Society.—The first meeting of this Society after the recess will take place on Thursday next, Oct. 7, at 8 p.m., in the Rooms of the Society of Arts, Adelphi. The discussion adjourned from the last meeting on lanterns, will be resumed, and Mr. E. Dunmore will read a paper on "How to cure a certain defect in gelatine films."

Dissolution of Partnership.—We learn that Mr. J. Traill Taylor, whose secession from journalism to the ranks of a certain phase of photo-commercial life (club portraiture) was announced over a year-and-a-half ago, has just executed a deed of dissolution of partnership with the other members of the firm with which he was associated, the terms of which dissolution are mutually agreeable.

A Lens with Variable Focus.—The property which the human eye possesses of forming distinct images at all visible distances is, as is well known, due to the power of the crystalline lens to alter its focal length. This wondrous action is beautifully illustrated by the lens with variable focus recently invented by Dr. Cusco. This ingenious device consists of two fine glass discs, set face to face in a suitable ring frame, and having an intermediate space, which can be filled with water, which is fed by a flexible tube from a small reservoir that can be raised or lowered at will in order to increase or diminish the pressure of the water. The reservoir may also take the form of a syringe bulb which can be pressed by hand. When there is normal pressure on the water, the discs remain flat, and the water lens is, therefore, a plane one; but as the pressure is increased, the discs become more and more convex outwards, and a ray of light passing through the lens is, therefore, more and more converged. In the same way, a concave lens may be formed by gradually lowering the water pressure. For making lenses of a certain focal length, Dr. Cusco's variable water lens is likely to be useful.—*Engineering.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

P. W.—In order to impregnate the washing water with a chloride.

Aram.—The hyposulphite bath should be neutral or alkaline. Ammonia, if added, should only be used in small quantities.

A. Z. L.—Too late. We are very sorry, but we gave plenty of warning in the News.

Cardinal.—About ninepence or a shilling.

Chemist.—They produce moonlight pictures because for the most part they can't produce sunshine pictures. The effect in printing is produced by toning very cold.

Sailor.—Personally we do not recommend it, but many photographers employ a few grains, thinking there is "something in it." We cannot recommend any maker especially; get a dozen on trial first of all.

I. L.—We doubt it very much, if his name is not on the instrument.

Piper.—Gordon Thomson is the artist; you could write to him at *Fun* Office.

Filey.—We have carefully examined the spots, and come to the conclusion that they are not due to hyposulphite. It is our opinion that the paper itself is at fault; the albumen coating is all right, but there may be grease or some similar markings which repel the silver, and thus cause insensitive or semi-insensitive patches. Examine your paper carefully when floating.

H. S. Jones.—The phenomenon is very curious, but has frequently been observed on different surfaces, although you are the first to bring it under our notice on a ferrotype. A slight corrosive or etching action is the cause, the image being bitten in mechanically upon the varnish.

C. J. E.—Any wide-angle lens would do what you want.

Music hath Charms.—Mr. J. F. Lowrie calls our attention to the fact that he finds music of great assistance, in studio work, as a means of securing pleasant expressions on the faces of his sitters. He hardly thinks every photographer will go to the expense of having a band attached to his establishment, but nevertheless it is worth while to bear in mind that not only children, but full-grown sitters, are sometimes all the better for hearing a cheerful tune. He tells us, by the way, that there are "Gem Photographers" who take from three to five hundred sitters on a fine day.

Charles Reid.—The series you send is a very fine one. Nos. 227, 114, and 160 are not quite equal to the rest, but all the others should command a ready sale, if put properly before the public. It is the great subject of complaint that photographers have no opportunity of fairly putting their work before the public; with the exception of the annual exhibition at Pall Mall, which is of limited duration, there are few exhibits of photographs, and therefore, if good work is produced, it will not sell, because the public are ignorant of its existence. However, of late years matters have certainly improved, and photographic publishers are getting more numerous and energetic.

E. Horner.—See Photographic News leader April 9th, and Answers of April 16th. If you cannot refer, let us know.

O. Georgie.—The bath should be very slightly acid. Keep the plates in the bath rather longer than usual. A thick piece of blotting-paper moistened in distilled water and placed upon the back of the plate before this is put into the dark slide will have the effect of keeping the film moist a long time; in these circumstances a wet plate can be kept for half-an-hour or more without drying, if the weather is not very warm.

D. H. T.—It would do as well as card, but hardly *better*, we think, for sometimes it has a yellowish tint which is objectionable.

Dr. Castle.—Marion, 23, Soho Square, would be a likely firm to supply you.

W. H. Plaister.—We hope to satisfy you with full information next week. We are engaged in investigating the very subject, and your plate furnishes us with another example the more of the evil. The transparent spots are evidently due to individual particles of iodide and bromide, but there is something more than this at fault.

Printer.—It is probably due to some peculiarity in the salting preparation employed with the albumen. Increase the strength of the silver bath. Has our correspondent used ten minims of citric acid solution to each ounce of bath solution? If he has done so, he has used too much. He had better try about five drops to each *solid ounce* of silver employed.

S. W. S.—They are the well-known plague spots, with which gelatine workers have been much troubled during the recent hot weather. There is no help for the negative, unfortunately. We hope to treat of the matter fully next week.

B. B.—The Photographic Society of Great Britain and the South London Photographic Society. Only the former has an annual exhibition, but the latter has a technical display usually once a year; perhaps you mean the last.

The Photographic News, October 8, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

Nitrous Acid in Silver Baths—Chloride of Silver in the Negative Process—Bromo-Iodised Collodion for Reproductions—New Photographic Academy.

Nitrous Acid in Silver Baths.—It is now longer than ten years since photographers were warned of nitrate of silver containing nitrous acid. The latter is easily formed by fusing the nitrate at a high temperature, and it causes fog on the negative. Crystallized nitrate has been recommended instead of fused, in order to get this fault once for all out of the way. It may be doubted, however, whether this is really free from nitrite, inasmuch as several manufacturers subject the crystallized nitrate to melting at a low temperature to drive out the last trace of acid, and then crystallize once more. It is now the question whether impurities of the nitrate are due to nitrite or not. A large quantity of nitrite is easy to detect. If chemically pure sulphuric acid is poured on to a small quantity of the suspected nitrate, the nitrous acid is expelled and decomposed with formation of red fumes. Smaller quantities are more easily detected in the following manner:—The suspected nitrate is dissolved in water, precipitated with an excess of potassium iodide, and filtered. The filtrate is mixed with starch paste and pure sulphuric acid, till it is distinctly acid. The sulphuric acid then sets the nitric acid free, and this decomposes the iodide of potassium, setting the iodine free, which produces an intense blue colour with the starch. A thorough investigation has lately been made by Belitzky, to obtain a more accurate view of the action of the nitrite on a negative bath. Water only dissolves small quantities of silver nitrite, so that a silver bath can contain at the most 1 grain per ounce. Belitzky has made baths which contained 1 grain of nitrite in 1 ounce, 3 ounces, 4 ounces, 5 ounces, and 10 ounces of the silver solution. The result of working with these was, that if plates were quickly sensitized and exposed, and immediately developed, they gave no fog. When they were sensitized long, however, and the plate was allowed to stand some time in the dark slide, fog was formed, which became thicker the longer the plate was kept before developing. The fog formation ceased, however, if the baths were mixed with as much nitric acid as would completely decompose the contained nitrite, and leave a little nitric acid in excess. Here Belitzky calls attention to a circumstance which, in fact, has been also very often observed by us. If nitric acid is added to a silver bath till it has a weak acid reaction, and gives plates quite free from fog, then it is not seldom found that after some days the acid reaction has disappeared, and the bath gives fogs again. The question here is, what has become of the free acid? It is thought that the free alkali of the iodine salt of the collodion has neutralized it. Belitzky has proved, on the contrary, that prepared baths with nitrite added show this phenomenon to a striking extent. If nitric acid is added to such a bath, then nitrous acid is next set free; this has a strong acid reaction; in the course of time it decomposes, however, spontaneously, and then the bath has again a neutral reaction. The best remedy to get rid of nitrous acid in such baths may be to acidify with nitric acid, and to boil. By heating, the free nitrous acid decomposes quickly; if then the bath is not acid, it can be weakly acidified, to obtain a properly prepared bath.

Chloride of Silver in the Negative Process.—In the last ten years the use of bromide in collodion was patented in America. To evade the licence, it was proposed to put chloride instead of bromide in the collodion. In fact, the action of the chloride is similar to that of the bromide, if, however, not quite so favourable. No more attention was given to the matter when the bromine patent ceased. It is more surprising to hear that chloride collodion is yet used in practice in the Government printing office of Vienna, the excellent accomplishments of which in heliography are commonly known. The office uses iodo-chlorised collodion for their reproductions of drawings, and, as we are told, the receipt is excellent. Chlor-iodo-collodium is used for the preparation of glass negatives for linear drawings.

Bromo-Iodized Collodion for Reproductions.—It is known that pure iodised collodion gives a much more intense picture of clear objects—as, for example, the white linen in a portrait—than bromo-iodized collodion; that the latter, on the other hand, renders the shadows and dark objects more powerfully. Pure iodised collodion works hard. The conclusion has been drawn from this, that it must be excellent for the reproduction of linear drawings, since here only black and white is dealt with. That is, however, an error; for this object a more sensitive bromo-iodised collodion is decidedly to be preferred. Since the objective is strongly darkened, as this is generally necessary to obtain the greatest sharpness, the picture becomes so extraordinarily weak in light, that even the white paper ground of the picture on the plate has no greater clearness than the deep shadows and dark folds in a picture of a person with a portrait lens. Since, now, bromo-iodised collodion renders better the dark parts of a portrait than pure iodised collodion, it also gives the dark places of the reproduction better. We have, in fact, repeatedly made the experiment with a drawing in black-and-white, with pure iodised collodion and bromo-iodised collodion, and obtained nothing at all with pure iodised collodion in the time of an exposure which gave us an exquisite picture with bromo-iodised collodion. On this ground we cannot recommend the addition of baryta to the silver bath, which makes the bath harder, but also insensitive.

New Photographic Academy.—Austria has the honour of being the first State which, valuing the high importance of photography, has founded a school for photography and photographic chemistry, in Salzburg. This school is a division of the Local Government Trade Institute, which possesses a large studio with a spacious laboratory, a room for photo-lithography and Lichtdruck printing, a studio for photo-zincography and galvano-plastic and heliography, a chemical laboratory and a lecture-room, and teaches, besides the cited branches of photography, the positive and negative process, positive and negative retouching, the not-to-be-forgotten carbon process, ceramo-photography, etching processes, photo-enamelling, &c. The school provides even more: well-trained pupils obtain appointments, and you may follow the course of half-a-year at the very low price of twenty shillings. We would not venture to get the chemicals at this price which a pupil use in this time. Surely many young students will ardently make use of this new opportunity to study photography in Salzburg, perhaps the most beautifully situated town in Austria, if there is not sufficient attraction to spend a summer there. They will never find beautiful landscapes wanting there; they will often find, however, beautiful storms, as Salzburg is the most rainy place in the Alpine district.

LESSONS LEARNT DURING A MONTH'S TOUR ABROAD WITH GELATINE PLATES.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.*

As I said before, this is the first tour on which I had entirely trusted to gelatine plates. Will it be the last? The plates that I took with me, which were made by myself, were of two classes—very rapid, and comparatively slow plates. The former were about fifteen to twenty times more rapid than wet plates, and the latter about four times only. The comparison with wet plates is more true than is usually the case, since they contained iodide to the tune of 15 grains to

* Continued from page 473.

120 of bromide. The rapid plates were prepared by the method I have described, and were picked plates—that is, only the best out of each batch were taken, the picking being necessary with some of my earlier ones owing to opaque dull spots which Coignet's gelatine so often engenders when not corrected as I have also described. The slower plates required no picking, as they were prepared with half Nelson's No. 1 gelatine, and half his ordinary opaque, the emulsion being boiled only for about five or six minutes, and then treated in the usual manner. Half my slides I invariably filled with one sort of plates, and half with the other, as I had a sneaking wish to give the longer exposures, the wish being fostered by my old apprenticeship to wet plate work. When one has worked for twenty years at landscapes with the latter, one has a pretty extensive knowledge of the exposure proper to give with it, and then, through perversity of human nature, one wishes to give such an exposure rather than to diminish or increase it by any given factor. In more communications than one I have stated that one of the great advantages of the bromo-iodide plates is the great latitude of exposure that is admissable, and it struck me that if by accident I should give a slow plate the exposure I should give to a wet plate, I should still be able to secure good results, particularly when I developed by a method I shall have presently to describe. Let me enumerate some of the exposures that were given to some of the plates. Here I transcribe a few.

(1). An open valley, bounded by snow mountains, 8·30 A.M., No. 2 landscape, wide angle lens, No. 3X stop, a rapid plate, 1½ seconds' exposure—correctly timed.

(2). Snow peaks seen from a height, no foreground, 2 30 P.M., rapid plate, same lens and stop, about ¾ second exposure—correctly timed.

(3). Same peaks seen from lower down, foreground of fir trees, same lens and stop, rapid plate, 2 seconds' exposure—mountains rather over-done, foreground rather undertimed.

(4). Everything the same except the plate, which was a slow plate; the distance shaded during exposure; the snow mountains received about 6 seconds' exposure, and the foreground about 20 seconds—resulting negative excellent in every way.

(5). An open view, no close foreground, 3 P.M., slow plate, 8 seconds' exposure—correctly timed.

These are examples which may be considered typical. It will be seen that where the view was fairly uniformly lighted, the rapid plates answered well, but where there was a dark foreground, there was every chance of the view being overdone in parts. It is next to impossible to shade off part of the view during a second's exposure, while it becomes possible and easy where the exposure is prolonged to (say) 10 or 20 seconds. Unfortunately for me, the proportion of quick and slow plates I had with me were as 4 to 1, and the lesson I learnt was that I wished the proportions had been the other way. For landscape work, then, I have quite come to the conclusion that, as a rule, a slow plate is more advantageous than a quick one; a plate 2 to 4 times more rapid than a wet plate is preferable to one 10 or 20 times more rapid. Why not, it may be said, instead of diminishing the rapidity of the plates, still further decrease the size of the stops? They are quite small enough already, and one has to beware of diffraction when the aperture is much smaller.

Let me now enumerate how my own plates turned out. I exposed sixty-four of them in all.

Defective Negatives.

One due to reversing it in the slide.

Two due to slight frilling (no alum was used, and this particular batch of plates required it).

Two due to defective plates (evidently dust during preparation).

One due to dust on the plate during exposure.

Two due to over-exposure of rapid plates.

One due to under-exposure.

Of the remainder, I should say that forty-two are really good negatives, and the remainder decent ones; in other words, that two out of three plates exposed are everything that can be expected from gelatine. Some of the passable negatives I rank under that category because they have small spots where bubbles collected during development, and thus spoilt their general character. This leads me to the subject of development, which is one that I cannot pass over. It will have been noticed the arrangement I took out with me. During part of time I had the advantage of a developing sink belonging to Mr. Darwin, who worked away with commercial plates, with what general results I cannot speak, but perhaps he will do so for himself. When with him I exclusively used Edwards' developer, and we both of us were troubled to a certain extent with the formation of air-bells, which damaged some of what would otherwise have been our best negatives. Going abroad again, I should most certainly, immediately the developer was over the plate, sweep over each plate with a broad brush to get rid of these nuisances, from which even ferrous oxalate development is not entirely free. The glycerine seemingly aggravates the nuisance, however, and the action of the alkaline developer is so rapid that even where the bubbles are discovered by the dim light used, the mischief is partially remediable. With ferrous oxalate, the development being slower, they can be brushed off, and no ill effects result. The lesson that I have learnt in this respect is this: not to develop more than one out of every five or six pictures taken, unless daylight (properly modified, of course) can be brought into requisition. By daylight all the small bubbles can be at once seen, which it is difficult to do by candle-light, and these are the great drawbacks to obtaining good negatives. Another point that the tourist should bear in mind is, that the night is rarely dark enough in July or August till late, and that he must stop awake to develop when he should most probably be in bed preparing for an early start. I found that to develop three or four negatives it was seldom that I could be in bed before half-past eleven o'clock, instead of two hours earlier. Luckily, one does not require so much sleep when one is in high altitudes such as at Zermatt, and hence the short night did not tell on me as it would have done at home. One other lesson in development I learnt, but that not till I came back, and that is to give plenty of exposure, and develop by ferrous oxalate developer.

Perhaps a rather detailed description of how I manage may be told without too much wearying my reader, if he have waded thus far into my history. Prepare a 16-ounce bottle of ferrous oxalate (not by the mixture of the two solutions, but in the good old-fashioned way, of saturating a saturated solution of potassium oxalate with ferrous oxalate), and take three teacups (thanks, Mr. Bolas, for the hint); into one (1), place 2 ounces of ferrous oxalate and an equal bulk of water; into another (2), 4 ounces of ferrous oxalate; into the third (3), 4 ounces of ferrous oxalate and ½ ounce of a 20-grain solution of potassium bromide.

To develop a plate, place it in a dish and cover it with one sweep with No. 1; if the image appear very rapidly, pour it back into the cup, and apply No. 3; if it appear slowly, use No. 2 instead; if moderately quickly, let it develop out with No. 1. Where you want to prevent strong contrasts, No. 1 is most effective. The negatives when developed in this manner are beautiful to look at. Moderate over-exposure is no drawback. No. 3 checks development, but gives intensity. Another point to be attended to is, not to withdraw the plate too soon, but let the image come well through the film; when you fancy it is dense enough, give it still another five minutes in the solution. The development is mechanical enough, in all conscience; don't make it more so than you can help, however. You can give a certain amount of real intensity, if you wish, by pouring strong developer on the parts requiring it. There is a dodge to facilitate this which I will describe on a future occasion.

The lesson is well worth having learnt, and I have seriously taken it to heart.

Now as to the number of negatives which can be taken in a day, I have something to say. Whether it is that abroad one becomes more fastidious I cannot say, but it frequently happened that on some days' walk four negatives were the most I took, the greatest number eight. Last time I went abroad I had the possibility of exposing but seven plates, with the result that only twice did I expose the full number, and this I laid down to the fact that there is an inclination to hoard one's stock when the number is limited. The carrying of twelve plates destroyed this illusion, and I think Mr. Darwin will back me up when I say that eight plates are sufficient to carry for any one day. Of course, I am not referring to any person who wishes to take duplicates of negatives, and perhaps a stereo of the same subject. I mean, that with confidence in your plates, and with only one size to take, eight plates are sufficient.

One point in Switzerland worth noting is that, as a rule, there is great freedom from wind in the valleys, and that there is seldom any difficulty in getting foliage perfectly steady, a blessing we are not favoured with in England, alas! too often; and another is, that cloud effects are often more beautiful amongst the mountains than at home. If you want a map of a peak, take it on a cloudless day; but if you want a picture, choose a day when some of these magnificent cumuli are hanging against the mountains.

Just a few words, in conclusion, as to what to avoid in a mountain expedition in regard to the carriage of the apparatus. Don't carry your camera out of its case and ready for action on any ice expedition. The camera when carried over the shoulder is very likely to go to grief, and yourself as well. My first glacier expedition damaged my camera through neglecting to put it in its case. When your camera is to be packed on a mule, for a long walk—excuse the Irishism—don't let it be so packed; make the muleteer sling it over his shoulder, and carry your camera-stand as well, but lock the leather case.

For most easy mountain expeditions a porter is more useful than a guide; he will carry your food for the day, and your camera, and only cost two-thirds of what a guide would do. I may provoke a smile when I say, don't carry your camera yourself if you can help it, particularly in any difficult places. If photography is to be a pleasure, the less you see of your apparatus, except during exposure, the more you will enjoy it. In planning an expedition in which your camera is to accompany you, allow one-third more time than is necessary if you walk straight on end. The camera can be unpacked and ready for use in three minutes; but if you have any real wish to produce a picture, it will take you ten minutes to secure one.

Lastly, I have found that the chambermaids abroad will soon be on your side as regards getting you water, pails, &c., by a few judicious words as to what she is to expect at your departure; and they have one good quality, which is, that if you ask them not to touch your negatives, they will come in to your wishes.

Gelatine plates are very nice for working, and very clean, but they are too mechanical for landscape work. Had I taken some of my old collodion emulsion with me, I feel sure that half my slides would have been charged with plates prepared with it. Gelatine has one great advantage, however, in that a lapse of six weeks between exposure and development makes absolutely no difference in the resulting picture, whereas, with collodion emulsion there is a risk of the undeveloped image fading. Though we can intensify a gelatine negative with silver, it is always with fear and trembling; with the old collodion emulsion, the fear is replaced by delight, the trembling by a feeling of certainty. Collodion is not yet banished from my photographic laboratory: will it ever be?

SIMPLE DIRECTIONS FOR THE CALCULATIONS OF EXPOSURES.

BY J. H. T. ELLERBECK.*

It is, perhaps, with most a matter of constant occurrence, when out on a photographic excursion, to be asked—"How long would you give with such a lens and such a stop?" or, "How long would you give on that subject?" Who can answer such a question at random? I want to show how each should do away with the necessity of asking such a question at all. It seems to me absurd that anyone should have to guess at the exposure, or rely upon the judgment of another, often a blind leader of the blind.

There was a very interesting account lately of a tour on the Continent by a well known photographer, and his first experience was of taking a trial plate, and being "lucky enough to hit the right time." Then, again, we have constant suggestions as to the best means of taking chemicals on a trip, to develop a few, occasionally, to see that they are all right.

My object now is to explain to those who do not rightly understand how, with a degree of certainty, with any lens, any stop, and any light (daylight), to calculate the necessary exposure. To illustrate this more fully, I will take as an example the lens I use myself, viz., Ross's symmetrical:—

The focus is seven inches, and the stops measure respectively 6, 5, 4, 3, 2 sixteenths. Divide 7 by these fractions, and the result is $18\frac{2}{3}$, $22\frac{2}{3}$, 28, $37\frac{1}{3}$, 56, or, as it is commonly called, $\frac{f}{18\frac{2}{3}}$, $\frac{f}{28}$, $\frac{f}{56}$, &c. These figures must now be squared, the numbers being 348·4=501 8 784=1393·5=3136. We then have the relative amount of light which reaches the sensitive plate in the camera.

It is necessary now, once for all, with the particular plate you know, to make a standard exposure—about which you have no doubt. Better do this in the best light you can get, say at ten or eleven o'clock a.m., late on in the spring. I find that with the gelatine plates most commonly in use, and taking a close subject, such as a group of cottages, &c., six seconds is necessary with No. 5 stop $\frac{f}{56}$. It is only a question of rule-of-three to find the others. Thus 3136 : 1393 : : 6 : $2\frac{2}{3}$ | 3136 : 784 : : 6 : $1\frac{1}{20}$, and so on. You have at once the exposure necessary for each stop under the conditions of light above named. If you use other plates or other lenses, make similar calculations for all, and construct such a table in duplicate, so that one is always at hand when wanted for reference. Mine is as follows, and I have found it often as useful to others as to myself:—

		SECONDS.				MIN.
	Stop.	Edwards.	Instantaneous.	Ordinary Gelatine.	Collodio-Bromide.	Pollitt's.
Ross' 5 Symmetrical, 7 inches focus . $\frac{f}{18}$	1	$\frac{1}{3}$	$\frac{2}{3}$	$2\frac{2}{3}$	45	$6\frac{1}{2}$
$\frac{f}{22}$	2	$\frac{1}{2}$	1	4	65	10
$\frac{f}{28}$	3	$\frac{3}{4}$	$1\frac{1}{2}$	6	100	15
$\frac{f}{37}$	4	$1\frac{1}{3}$	$2\frac{2}{3}$	$10\frac{2}{3}$	177	$26\frac{1}{2}$
$\frac{f}{56}$	5	3	6	24	400	60
Globe lens, $2\frac{1}{4}$-inch focus... ... $\frac{f}{10}$	1	$\frac{1}{11}$	$\frac{3}{16}$	$\frac{3}{4}$	—	—
$\frac{f}{20}$	4	$\frac{1}{3}$	$\frac{3}{4}$	3	—	—
Portrait lens, 4-inch	Full aperture.	$\frac{1}{100}$	$\frac{1}{50}$	$\frac{1}{12}$	—	—
	Med. stop.	$\frac{1}{24}$	$\frac{1}{12}$	$\frac{1}{3}$	—	—

By this table it is easy at a glance to gain all the knowledge required on this point. The only calculation necessary in the moment of working is for other than the normal light.

* Read before the Liverpool Amateur Photographic Association.

It is now some years since I first read a paper on the use of the actinometer in connection with exposures out of doors, and it is satisfactory to know that their use has since then largely increased; but still they are either misunderstood or undervalued, and at the risk of repeating much of what was then written, I would wish again to call attention to the great advantage gained by the use of one of these little instruments, and to show how simple is their practice.

When the Autotype Company's actinometer is exposed to the sun at the same time that the trial plate showing six seconds for f, as above is done, we get a tint—that is, the sensitive paper darkens to the same shade as the surrounding paint—in thirty seconds. Now, supposing, on a dull day, you try the actinometer and get a tint in four minutes, you must multiply your calculated exposures by eight, because it takes eight times as long to get one tint on this day as it did on the day when those figures or calculations were made. If it takes twenty times as long—say ten minutes—then multiply by twenty, and so on, and you get the right exposure for that day and hour. Nothing is easier. The tinting can go on while you are fixing the camera and focussing, and no time need be lost.

The other day a friend and I went nearly a hundred miles for a day's out. The subjects chosen were overhung with trees, and the sun shining brightly overhead. My friend (an old hand) thought he would have to give a long exposure, and gave twenty times longer than usual. I used the actinometer, and got one tint in fifty minutes, showing that $\frac{99}{100}$ of the light was stopped by the trees in this glen. Was the time lost in the calculation? I think not, for I brought home twelve good pictures.

I must repeat that the actinometer does not relieve you of the necessity of using judgment; it simply tells you the strength of the light, but does not supply the place of brains. There are many other conditions necessary to be studied, viz., colour, distance, position, &c. Here it is that experience only will help.

I would respectfully offer a suggestion to makers of lenses. They make thousands, and one calculation would save the trouble of the thousands who buy them if they would mark on the stops their aperture and its value, as I have mentioned above—so easy to them, but so difficult to many to whom optics is a science unknown.

And yet another suggestion:—Instead of makers of dry plates stating that these plates are five, or ten, or thirty, times as quick as wet plates (there are many who have never touched a wet plate in their lives), let all sensitiveness be stated definitely, thus:—Our plates, with a compound lens $\frac{f}{30}$, require an exposure of $1\frac{1}{4}$ second in summer, midday, sunlight, or any other such standard as they may deem proper. This would put a stop to those vague statements which nobody understands. Wet plates vary almost as much as dry plates, and ought not to be used as a standard.

There is nothing new in anything I have said, but there are many to whom I know these notes will be useful if taken advantage of; and this is my only apology for a twice-told tale.

PRESS NOTICES OF THE PHOTOGRAPHIC EXHIBITION.

[*From the* Daily News.]

By way of taking note of progress made in photographic art, the president and council of this Society annually bring together in the rooms of the Society of Painters in Water Colours a considerable collection of the choicest works of the past year. The current Exhibition was opened on Saturday evening, when Mr. Glaisher, F.R.S., president, and several of the leading members of the council, received at a soirée a large company of ladies and gentlemen who had been invited to see the pictures. Walls and screens were hung with exhibits, ranging over the principal classes of photographic production. Enlarged works perfected by the Woodbury and Autotype processes were naturally the most conspicuous, notably a full-length portrait of Mr. Gladstone, from a painting by Girandot, a "speaking likeness" of Lord Cairns, and a statuesque representation of the late King of Siam, with surroundings of Oriental state. Full-sized portraits of Sarah Bernhardt, faultlessly executed by Messrs. Downey, and a small gallery of other feminine celebrities from the same studio, were not the least attractive and interesting of the exhibits. These, however, though of the highest class of photographic portraiture, claimed no exceptional rank. Perhaps the very newest marvel of the art was a set of scenes by Messrs. Marsh, representing swans on the Thames at Henley. It is scarcely too much to say that, from a realistic point of view, these pictures are very near perfection, a fact that is to be attributed to the marvellous rapidity with which the artist secured his subject. Not more than the hundredth part of a second of the action of light was brought into play to obtain a representation of water that seems to flow and swans that appear to glide. Gems equally artistic, representing yachts in motion off Woolwich, also taken by the instantaneous process, are shown by Mr. Mayland. Similarly striking results have been obtained by G. J. Paget in views of passing trains, J. H. Ritchie with ships, and G. W. Williams with scenes on Ramsgate and Margate sands. At first glance these objects appear to have been taken motionless, but on a moment's inspection the observer will see from the ripple that the ships have "way" on, and from the steam of the engines that the trains are travelling. Results such as these are due to the recent adaptation of gelatine as a substitute for the old collodion processes. In operations by the latter wet-plate system a second or two, more or less, of exposure was of little consequence. In the new dry process a minute fraction of a second may spoil the picture.

Science and invention have come to the rescue in Cadett's instantaneous shutter, by which clever apparatus, worked pneumatically, by slight pressure of the thumb and finger, the exposure can be regulated to the one-hundredth part of a second. A companion invention is the Warnerke actinometer, a small circular box, after the fashion of an aneroid barometer, containing a phosphorescent wafer, which, when obscured by successive revolving layers of a thin gelatinous preparation, indicates the exact strength of the prevailing light. While these were some of the most recent developments, visitors found in almost every one of the exhibits fresh and varied interest. In "Maiden Meditation Fancy Free," and similar artistic scenes from nature, Mr. H. P. Robinson, of Tunbridge Wells, represents a class of art going considerably beyond mere statuesque reproduction. It is scarcely necessary to mention Mr. Vernon Heath's trees, ferns, and landscapes, nor to remark upon the many excellent architectural scenes, notably those of Old Bristol, by W. Harvey Barton, and the interior of Chester Cathedral, by Silvester Parry. Medallists of the year are:—W. Mayland, W. H. Barton, Seymour Conway, Marsh Bros., T. G. Whaite, A. Pringle, H. P. Robinson, Silvester Parry, the Berlin Photographic Company, and the Platinotype Company.

[*From the* Times].

The annual exhibition of the works of the photographers, which is now open at the Gallery of the Society of Painters in Water Colours in Pall Mall East, affords a very interesting display in the various branches to which photography is now being usefully practised—in portraiture, landscape, seascape, cloudscape, architectural views, large assemblies and moving crowds, wild animals, rare plants and flowers, machinery, and such complicated scenes as the Tay Bridge ruins, or anything, in fact, which in its wild complexity defies the power of the artist's eye and hand to represent. In portraiture, which is unquestionably the most universal, and perhaps the most valuable, of the applications of photography, there seems to be some considerable advance to be noticed, particularly in the pictures of children. As the most beautiful of children are apt to be the very worst sitters, the painter rarely succeeds in catching those fleeting graces of air and look that give such charm to the child portraits of Sir Joshua and Gainsborough. But what the photographer may lack in the rarest gift of the painter he supplies with wonderful success by the appliances of his art. His plate has now been made so "sensitive" that in the fraction of a second the portrait is stamped upon it; and such is the perfection of the means which chemical science has brought to his hand, that the difficulty is how to work up to such a point of nicety in manipulation—how to avoid too long exposure. Here, again, he has been helped by science; his camera is provided with an "instantaneous view shutter," which acts by means of a long pneumatic tube with a common elastic bulb at the end, so that the camera can be opened or closed either slowly or with rapidity, and this at a distance of many yards from the apparatus, according to a scale by which the spring of the instrument is set. Thus the photographic portraitist can, if he pleases, attract the attention of the most fidgetty child by playing with it, and seize the right moment to take a sort of flying shot at the

prettiest pose. The same simple though very ingenious contrivance enables the landscape painter to catch passing effects of sunlight and cloud. Another most useful invention is an actinometer, invented by M. Warnerke, by which the photographic strength of the daylight or artificial light may be exactly measured. It consists of a small case like a watch, having a space filled in with a small disc of sulphate of barytes or any substance that becomes phosphorescent after exposure to light. By opening the lid and allowing the light to affect this substance for a few minutes, then closing it and examining what number can be seen through on a revolving scale plate of different degrees of transparency, the strength of the light is discovered. There are some excellent specimens of portraits of children by Mr. R. Faulkner in the exhibition, and a remarkably pleasing and artistic vignette of the Princess Louise of Wales. The cabinet portraits of children by Messrs. Hills and Saunders and Mr. W. P. Marsh are also noticeable as other good samples. Landscapes abound, all, of course, realistic enough, but in very few instances conveying much of the pleasant lifelike air and freshness of natural landscape. Most of them are sadly wanting in delicate gradations, being too bright in the lights and too deep in the darks, and frequently in a tone either too brown or too purple. Those of Mr. Vernon Heath are some of the best in delicacy of gradation and in agreeable tone of colour, and the subjects are chosen with much artistic feeling, particularly "The Hermit's Tree," in Windsor Forest, and some foreground studies of hillsides of ferns and furze. One of the medals of the Society for landscapes and views of buildings is awarded to his "Glen Froome" and another woodland scene, with a view of St. Stephen's, Bristol. Some good views of Italian scenery also gain a medal for Mr. Andrew Pringle. As an example of the length of time sometimes required for actinic action in interiors such as that of a cathedral, that of Chester Cathedral nave and choir, by Mr. Silvester Parry, a large print which took three hours' exposure, is remarkably good, and well merits the distinction of a medal awarded to it. In contrast with this, however, should be noticed many of the instantaneous impressions, such as the admirable one by Messrs. Marsh, of Henley Regatta, with the crowd of boats and figures all most distinctly shown, so that almost every man in the two racing boats could be recognized. Margate sands swarming with excursionists, a yacht sailing race, and other photographs, by G. W. Williams, are capital successes in some of the subjects so impossible to artists. Mr. Dixon's portraits of the tigers in the Zoological Gardens, enlarged from very small plates, not larger than an inch or two, are singularly good, and show the exquisite perfection of the process. With these interesting portraits of animals should be noticed also the studies of swans by Messrs. Marsh, in which the peculiar grace of the bird and the beautiful white of the feathers are caught with wonderful exactness, and every ripple on the water seems to sparkle in the light. In this case a medal is awarded, as well as to the charming little sketches, as it were, of fishing boats and shipping off the coast, by Mr. W. Mayland. Some landscapes by the School of Military Engineering, and others by Dr. Huggins, Mr. F. A. Bridge, and Mr. E. Gould, all printed in the platinum process, show that this is a method which is gaining ground, and is certainly to be preferred both for delicacy of gradation and an agreeable grey tone which gives the appearance somewhat of a good pencil drawing, besides being quite indestructible. We observe that there is now a Platinotype Company, as there has long been a Woodburytype and an Autotype, whose productions are largely employed in book-illustration and reproduction of pictures. In the important application of photography to copying famous pictures of large size, the Berlin Photographic Company contribute a silver print of the same size as the picture of the Madonna di San Sisto in the Dresden Gallery. This fine copy was taken in nine separate plates, each about 36in. by 24in., and with such perfect success that the Society has given it one of the medals. Some interesting specimens of early trials of photography may be noticed, among which is a small portrait, taken in 1839, of Madame Daguerre, the wife of the discoverer who gave his name to the method, and another of one of the first ferrotypes taken in America in 1855, so called from being done on thin iron instead of glass. These are so cheap that they are used by the perambulating photographers of the fairs and racecourses. It will be gathered from what has been said of the present exhibition that photography in the past year has not come much nearer to the solution of the great problem of making the colours of nature print individually and autographically upon the plate. The means of operating have been vastly improved by chemical, mechanical, and optical science, but the pictures still want that something more than light and shade which colour only can give.

[*From the* Globe.]

Although several of the most able professors of the art are not among the contributors, the exhibition of the Photographic Society of Great Britain, which now occupies the Gallery of the Society of Painters in Water Colours is no less varied and interesting than those of former years. Apart from the beauty and completeness of a large proportion of the works, it is remarkable for the diversity of means employed in their production. Examples of the gelatine process, by which the most instantaneous pictures are produced, are more numerous than on any former occasion. The especial value of the method is admirably exemplified in the studies of "Dogs Swimming" and of "Swans" by Mr. Marsh, and in the groups of "Children at Play" by Mr. T. G. Whaite, in which gestures and movements of the most transient kind are faithfully recorded. Of the Platinotype method of printing, by which absolute permanency is said to be secured, there are also many examples. Though many of them are unpleasantly cold in colour and wanting in depth of tone, there are a few which scarcely suffer by comparison with anything in the collection. A copy of Mr. Burne Jones's "Golden Stairs," by Mr. F. Hollyer, and reproductions of an "Engraving by Hogarth" and "Sketches by Sir Edward Landseer," by the Platinotype Company, are among the best examples. Copies of pictures, drawings in black and white, and rare engravings form an especial feature of the exhibition. By the Autotype Company there are reproductions of eight plates in Turner's "Liber Studiorum," which only the most critical eye could distinguish from the originals, and there is an excellent copy of Leonardo da Vinci's splendid cartoon belonging to the Royal Academy, which, however, is not mentioned in the catalogue. But the most remarkable work of the kind is a copy of Raphael's great picture "The Madonna del Sisto," in the Dresden Gallery, exhibited by the Berlin Photographic Company. This is composed of nine separate photographs accurately joined together, and is the same size as the original picture, of which it is in all respects a faithful reproduction. Numerous as are the engravings of this fine picture, we know of none that gives so vivid an impression of its beauty. The photographs taken directly from nature include subjects of the most varied kind, landscapes, as usual, largely predominating. Among these the numerous Italian scenes by Mr. Andrew Pringle are especially noteworthy, as well for the artistic taste shown in the choice of subject as for their perfect manipulation and purity of tone. His views of "Tivoli" and the "Palace on Palatine Hill" are unsurpassed by anything in the collection. Mr. Vernon Heath maintains his long-established reputation by a series of pictures on a large scale, including a wonderful study of moss-grown rock, called "On a Hill Side," and two sylvan scenes of rare beauty, "The Hermit's Tree at St. Leonard's Vale" and "The Queen of the Forest." Besides being admirable examples of photography, these form most agreeable pictures, the point of view in each case being well selected with regard to composition and effect of light and shade. Mr. W. Harvey Barton sends a large number of picturesque architectural views, and Messrs J. Valentine and Sons contribute a frame containing a series of beautiful transcripts of Highland scenery. The numerous rural studies by Mr. C. A. Ferneley are entitled to high commendation, and not less so are the views on the Thames exhibited by the School of Military Engineering. The figure-subjects present little claim to notice. The colossal heads, enlarged from small negatives by the Woodbury Company and the Autotype Company, differ in no important respect from similar examples which appeared last year, and the smaller portraits are for the most part thoroughly sophisticated productions; most of them are so completely stippled over that the character of the original photograph is entirely destroyed. In the portraits of children by Mr. R. Faulkner, however, photography and water-colour painting are felicitously combined. On these, skilled artists have obviously been employed, asperities have been softened and discordant facts obliterated without in any degree interfering with the spirit and character of the photograph. There are some complicated compositions in the collection, but in none of them are the figures grouped with much regard to pictorial beauty; but a few single figures, and especially those by Mr. H. Garrett Cocking, are worthy of notice for their graceful treatment and the skilful way in which the draperies are disposed.

The Photographic News.

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THE PHOTOGRAPHIC EXHIBITION.

To grumble at the shortcomings of a banquet to which you are invited, is not only bad manners, but very ungracious behaviour into the bargain; but there is this excuse for us, in expressing a few words of dissatisfaction at the outset, namely, that the Photographic Exhibition partakes more of the nature of a picnic than a formal gathering, and if the entertainment provided is not in every way praiseworthy, this is due rather to a lack of co-operation on the part of some, rather than to any deficiencies in the fare that has been provided. Names that are familiar not only in connection with good work, but with contributions that usually form the chief attraction of this yearly gathering, are absent from the catalogue, and if it had not been for the goodly contingent of new exhibitors, this year's show of pictures, about which there has been so much speculation and tiptoe-expectancy, would have fallen far below the average of former years. Francis and William Bedford, whose clear soft landscapes of dark purple tone are so familiar to the visitor at Pall Mall, are unrepresented this year. Of William England's name, the walls are equally silent, and we must perforce wait another twelvemonth for the wonderful results of his last campaign among the Swiss mountains, for those caverns of translucent ice, those white crystal glaciers sweeping down among the black firs, those clear-shadowed cascades, he knows so well how to imprison in the camera. Colonel Stuart Wortley has neither bright cloud nor breaking wave; Slingsby of Lincoln fails to put in an appearance with picture or portrait; and Captain Abney has neither stalwart oak nor tiny fern or floweret to remind one that his pretensions to art are hardly less marked than his title to science. The graceful foliage and sweet summer pictures of Payne Jennings are absent, as also the dainty flower studies of Mrs. G. Payne; and of foreign portraitists there is scarcely a representative. As it is, there are signs of progress, no doubt, but not such proofs as one might have expected from the initiation of a "new era," as the advent of gelatino-bromide has been rightly termed. At Wimbledon, when the small-bore rifle gave place to the old Enfield, there was, it will be remembered, a marked improvement in the shooting; and similarly, it was only to be expected that with better means at their disposal, photographers would this year have made some marvellous practice. But the exhibition, small as it undoubtedly is, fully bears out the expectations of the most sanguine upon the capabilities of gelatine. The instantaneous studies of swans, by Messrs. Marsh Brothers, of Henley-on-Thames, for which one of the medals were awarded, are marvels. The life and animation of the birds, their firm, snowy plumage, and, above all, the troubled motion of the water upon which they move, make up a picture that for truth and brightness is unrivalled. The water alone is a study; its surface, while smooth as a mirror, is broken into eddies by the quick-turning swans, and hence there is that viscid appearance of molten metal upon the pool which constitutes one of the principal charms of the picture; there are, indeed, patches of iridescence upon the liquid surface, and in one place, where a drop of water has fallen from the swan's bill, a series of tiny circles mark the spot. Altogether, the scene is a triumph of photography and happy artistic rendering.

Altogether ten medals were awarded. An eleventh would without doubt have been secured by Mr. Gale's charming little series of Brittany and Normandy, had Mr. Gale not been *hors concours* as one of the jurors. The recipients were Messrs. Marsh Brothers, Mr. Mayland of Regent Street, Mr. H. P. Robinson of Tunbridge Wells, Mr. Barton of Bristol, Mr. Seymour Conway of Beckenham, Mr. T. G. Whaite of Brighton, Mr. Silvester Parry of Chester, The Platinotype Company, Mr. Andrew Pringle of Knowlesworth, and the Berlin Photographic Company.

To begin with the last mentioned, the medal is awarded for a magnificent copy of Raphael's Madonna di San Sisto, from the Dresden Gallery. When we mention that the copy measures no less than 10 feet by 6 feet, and that none of the details of the priceless original appear wanting, it must be conceded that it is a work upon which the stamp of approval may well be set. It is the work, we hear, of Herr Hoffmann, and it is printed in nine sections, all of which are so well matched in tone and detail that the junctions are not easily discovered. The cost of this fine copy is stated to be seventy-five guineas, but as it stands in the same relation to the painting as a large cartoon, the price to a connoisseur or collector is scarcely high. In any case, it shows to what perfection the copying of large classic paintings may be brought.

Mr. H. P. Robinson of Tunbridge Wells, another medallist, sends four pictures. "In Maiden Meditation Fancy Free" (201), has attached to it the green label "medal," and so we suppose it was the most favourably regarded by the jurors. A young girl stands beside a tree, holding a broken branch in her hand, glancing round half coyly, half roguishly. Has she screened herself from the view of some one, and is that some one approaching? There is a freshness and a girlishness about the dimpled face that is very winning, and a modesty with al that tells of rustic simplicity. There is, too, a mixture of timidity and "come-if-you-dare" in the pose under the tree that is exceedingly taking. "At Gwysaney Hall" (202) represents the stone steps and pertico of an old lichen-grown mansion, with a group on the threshhold; it is like a familiar bit of painting from Haddon Hall, the harmonious detail of the picture being free from any of those hard photographic touches, those white hard lights or inky shadows on the coping stone and window sill. "Dorothy" (215), a black oak interior, with a little white-robed lady standing at the casement, the third of the series, is a triumph over a difficult subject; and the fourth is a study of sheep (216), in which the artist has been bold enough to seize the moment when the backs of the fleecy models were bathed in silvery sunshine.

Mr. Barton's pictures are a prominent feature of the Exhibition. His pictures of Bristol are peerless; "A Bristol Mansion of the Olden Time" (38) is to our thinking the best of the series, a photograph with those qualities of which we have just spoken in "Gwysaney Hall." There are detail, depth, harmony, and all absence of hardness. You might walk into the "Mansion," there is so much space and atmosphere, and from ground-floor to roof, the building is as softly rendered as in a painting, and yet there is no lack of contrast. St. Stephen's Church, Bristol (39), a difficult problem, as every photographer is aware who has had to do with lofty architecture, is another magnificent victory of photographic art; indeed, all Mr. Barton's architectural studies exhibit high ability and exquisite finish. "Wickham Bridge" and "Autumn Morning" also show the hand of the master, and with the former especially—note the water under the bridge—no one can fail to be pleased. But, perfect as these landscapes are, it is in his treatment of architecture that Mr. Barton makes his mark.

Mr. Mayland (13) depicts the busy Thames. His series

of a dozen prints of swift steamers, brown-sailed barges, and masted Indiamen, would have been impossible before the gelatine era, and are now only to be caught by a cuuuing hand in combinatiou with a practised eye.

> "And from the bosom of the busy stream
> These in the fraction of a moment snatched."

Mr. Mayland has indeed "snatched" his pictures in "the fraction of a moment." They are simply marvellous. The fine ropes of the shipping are represented with spider-web sharpness; the paddle-wheels appear iu full motion, the funnels are vomiting coal black smoke and silvery steam, the crews are busy with tackle, there is a coming and goiug of craft in all directions. It may be a silent highway that Mr. Mayland has depicted, but it is a very animated one.

Mr. T. G. Whaite's series (101, 136, and 137) are notable for the circumstance that not only are the models well posed, but they are all examples of chamber photography. Some are taken iu drawing-rooms, others in bed-rooms. It is not merely a case of sitter and background in these pictures, but the portraits have the appearance of being taken "At Home." The lighting and modelling of some of the iufant sketches, "Good Night," "Ready for the Bath," &c., betoken also much thought aud study, and the careful realization of happy ideas.

Mr. Seymour Conway shows two frames of views (77, 161), whose qualities are softness and harmony. Here also gelatine has been employed, and, as in the case of Mr. Whaite's pictures, the gelatino-bromide is home-made. It is in interiors that Mr. Conway probably excels, but all his work is characterised by that smoothness and evenness that denote the careful and accurate worker. Mr. Pringle has also two frames (171 and 175)—all Italian views—of which probably Tivoli and the Bridge of Sighs will be the most liked. Tivoli is exceedingly fine; vigorous and brilliant, while yet harmonious to a degree, it represents a model landscape photograph. Mr. Silvester Parry (269, 340, 342) receives a medal for his "Chester Cathedral Restored," a magnificent interior measuring twenty inches It is from a wet collodion negative, exposed for three hours, and the rendering of delicate carving over the stalls and the wrought stone-work of the arches is a beautiful example of photographic delineation. The Platinotype Company well earn their medal by the array of rare prints (326 to 336), that include almost every phase of photography. The tint of these prints is most delicate and agreeable, and we cannot help thinking that there is, too, a gradation of tone that approaches more nearly to silver printing than anything we have seen in former years. If Platinotype has not yet reached perfection, it is very close upon it.

We have here merely noted the medal photographs. There are other pictures in the Exhibition quite equal in merit to some of those we have referred to, and of which we shall speak in our next, when we propose to go seriatim through the list of exhibitors.

ON THE LIGHT-COLOURED SPOTS ON GELATINE EMULSION PLATES CAUSED BY FATTY MATTER IN THE GELATINE.

Gelatine plates often exhibit light-coloured spots, with an indistinct outline, which, in printing, give rise to much inconvenience; for in these places the film of silver appears to be much thinner. These spots are distinctly different from those caused by dust, &c., for the latter have nearly always a dark nucleus. Still less can they be mistaken for those produced by air-bubbles, which adhere to the film in developing, and thus prevent the developing solutiou from acting equally everywhere, for these latter have a sharply-defined edge, and remain of a pure white colour during the whole process of development. The spots produced by air-bubbles are visible by reflected light, whereas the grease spots are only seen by transmitted light.

The grease spots can generally be recognized before developing, for the film appears to be thinner in those places, and remains also thinner during developing, and after fixing. They are, moreover, not identical with the light-coloured spots due to the presence of air-bubbles in the gelatine emulsion, although in their outward appearance they most resemble these.

Are these so-called grease spots really due to the presence of fatty matter in the gelatine? We cannot answer this question in the affirmative for certain, though it appears very probable that they are due to this cause. Our readers will probably agree with us when they have noted the best means for getting rid of the difficulty. We may also observe that the formation of grease spots is very much less common in Nelson's gelatine than it is in the hard French gelatine of Coignet, or in the German gelatine of Vereutz. Unfortunately, Nelson's gelatine is very soft; it is therefore necessary to purify the above-mentioned hard gelatines of fatty matter when they give signs of being affected by it.

Very often little fatty globules can be seen with the naked eye floating on the surface of a thin solution of gelatine; when this is the case, an emulsion made with such a gelatine is sure to exhibit grease spots. The spots may be got rid of, and the silver bromide plates rendered homogeneous, by filtering the gelatine several times through moist flannel or filtering-paper. We have often tried the above experiment.

Another perhaps simpler method is to make a tolerably concentrated solution in water, and to let it stand for a little time until it has perceptibly cooled, and there is formed on the surface a solid skin, in which the fatty matter is entangled. If this skin be skimmed off, the fatty particles will mostly be removed with it, and an emulsion prepared with the remaining gelatine generally gives immaculate plates.

With regard to the grease spots, Van Monckhoven remarks:—"They are often found on the surface of films. Sometimes these spots show themselves as transparent circles, sometimes as dull spots which are readily seen under a bright light when the films are dry. The latter kind are darker than the rest of the image." Our own opinion is that these dark spots cannot, with the same certainty, be ascribed to the presence of fatty matter; it is only the transparent spots, as we think, that can really be called grease spots.

From a gelatine emulsion the fatty particles can generally be removed in the same way as from simple gelatine. The appearance may freqnently be guarded against by working with an emulsion as gently heated as possible, and by coating the plates with a thick film; further, by dissolving the gelatiue in less water than usual.

If an emulsion, made with fatty gelatine, be treated with ammonia (2 or 3 parts ammonia to 100 parts emulsion), the fat will be saponified and decomposed. When correcting a washed emulsion by this method, care must be taken not to raise the temperature too high, or to let the cooking be carried on too long, or fogging will be the result; for in a washed emulsion the soluble bromide (which acts as a restrainer) is wanting, and any carelessness will produce fogging. With this treatment we have generally observed a total disappearance of the grease spots; sometimes, however, we have been able to lessen the evil, but not to remove it altogether.

The following method also produces a good effect:—Precipitate the gelatine or the gelatine emulsion with the strongest alcohol, and wash it several times in the same fluid. In this way the fatty particles are also pretty well got rid of; but as we have often observed that gelatine emulsion, after being precipitated by alcohol, is re-dissolved with difficulty in water, we are unable to recommend this method of curing the evil.

In our opinion, the first two methods which we have above described are the simplest and surest, namely, either repeated filtering, or skimming off the upper surface of the gelatine when it has set. When these methods are unavailing, ammonia or alcohol may be resorted to.

Notes.

The Photographic Exhibition at Pall Mall remains open till Saturday, the 13th November.

Colonel Stuart Wortley has just returned to England from a voyage round the world. He was present at the Sydney Exhibition.

Both Mr. H. Stacey Marks, R.A., and Mr. Henry Moore, the well-known sea painter, were present on the jury of awards this year. It is something to know that painters of the highest eminence are not above giving their advice and assistance upon matters photographic, and to find that they are willing to devote valuable time in appraising the work of photographers.

Military gun-cotton will keep, but collodion cotton will not, if stored dry, for any length of time. Such is the prevailing opinion, and there cannot be a doubt that it is supported by facts. Samples of collodion pyroxyline kept in stoppered bottles almost invariably give off red fumes after a while, especially if the place of storage is not particularly cool; and when acid fumes once arise, decomposition goes on apace.

On the other hand, gun-cotton manufactured for military purposes has been kept for years in magazines without undergoing decomposition. It is true that, as a rule, large stores of it are kept wet, with about thirty per cent. of water, but the wetting is to render the material innoxious rather than to assist in its preservation. Only if confined in warm localities does the military gun-cotton give off fumes; stored in magazines under ordinary circumstances—the magazines, of course, being both cool and airy—it fails to act upon blue litmus paper, though the latter may be left in contact with the gun-cotton for months.

Collodion cotton and military cotton are, as we know, two different compounds, the former being termed bi-nitro-cellulose, and the latter tri-nitro-cellulose; moreover, the one is soluble in ether and alcohol, and the latter is not—at any rate, to any appreciable degree. But there is something beyond this that may account for the difference in their keeping qualities. The military cotton is prepared especially with a view to its preservation. After being acted upon by the acids, the cotton is pulped, and in this fine state of division thoroughly washed in water. Further, it is treated with a solution of carbonate of soda to remove any trace of acid remaining behind.

Now the question is, whether the keeping qualities of bi-nitro-cellulose would not also be much improved if similarly treated. Meanwhile, we know that if, as in the military magazines, precautions are taken to wet collodion cotton, its preservation in good order is at once ensured.

The heroine of the Ghent Photographic Exhibition was Mlle. Relvas, of Gollega, Portugal, who received for her magnificent collection of pictures the highest award in the power of the jury to bestow—namely, a silver-gilt medal and diploma. M. Relvas is well-known in the suburbs of Lisbon, not only as an accomplished amateur photographer, but as one of the keenest gentleman-riders in the Oporto and Lisbon steeplechases.

The Ghent Exhibition awarded three classes of medals—silver-gilt, silver, and bronze. The Cornwall Society awards silver and bronze medals; while the Society of Great Britain gives only bronze. But Bristol, whose "international exhibition" is held in December next, promises, we see, medals of gold, silver, and bronze—an inducement that is likely to secure a goodly number of competitors. The Bristol Exhibition, by-the-way, is to be made a triennial affair, it is said.

Aniline colours and photography would seem to have little in common, although two of our best photographic chemists—Mr. Spiller and Mr. Friswell—occupy themselves with the manufacture of these beautiful dyes. Still, strange to say, aldehyde green, one of the most valuable of the series, owes its discovery entirely to a photographer, whose advice, given naively enough at the time, may now be set down as having been worth many thousands of pounds.

We give the story on the authority of Henry Watts, F.R.S., the librarian of the Chemical Society. In 1861, Larett obtained a very beautiful blue by the action of aldehyde on a solution of rosaniline salt in sulphuric acid. The colour, magnificent as it was, proved, however, utterly unstable, and, therefore, useless as a dye. Another chemist, Cherpin, tried his best to fix the blue, but his efforts were unavailing; in this strait he mentioned the circumstance to a photographic friend, who recommended him to try hyposulphite of soda, since this was used for "fixing" photographs. Cherpin followed the advice, but what was his astonishment to find that, instead of fixing his blue, he turned it into the splendid green dye which is now known as aldehyde green.

We were talking the other day about mottoes for photographers, taken from the poets. Dr. Diamond sends us one of the most appropriate we have yet seen, from a poem of Dr. Watts:

> "Sounds which address the ear are lost, and die
> In one short hour; but that which strikes the eye
> Lives long upon the mind; the faithful sight
> Engraves the image with a beam of light."

From poet to painter is but a step; here is a quotation from Sir Joshua Reynolds, that would not inaptly refer to photography:

> "As our art is not a divine art, so neither is it a mechanical trade; its foundations are laid in solid science."

Topics of the Day.

A DRYING-CLOSET FOR GELATINE PLATES.

BY WILLIAM BEDFORD.

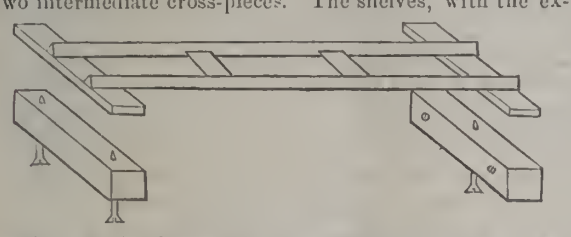
Now that the season is approaching when not only experts, but also experimentalists new to the process, will be giving their attention to the manufacture of gelatine plates, I ventnre to describe a closet, constructed last winter, in which I have, with certain advantages, satisfactorily dried many dozens of plates.

My aim, in this contrivance, was to dispose of, until dry, a limited number of coated plates with as little exposure as possible, not only of the sensitive films, but also of my own eyesight, to red light, and at the same time to avoid all needless manipulation.

Heretofore, I had been accustomed to lay out the plates, until the gelatine was set, on a levelled plate of glass, and when that was covered, they had to be transferred to the drying-closet, in order to make room for more; a process which involved some considerable loss of time, and a good deal of unnecessary handling. Having everything ready to commence work, I can now keep on coating until the whole batch of plates is transferred to the closet, there to remain undisturbed until they are dry, and ready for packing up.

The closet is constructed to contain three dozen 10 by 8 plates, or two dozen 12 by 10 plates, or an equivalent number of smaller sizes, the inside dimensions being: height, thirty-eight inches; width, twenty-nine inches; and depth, from front to back, fourteen inches; and there is an arrangement attached to the bottom in the shape of a galvanised iron trough, through which the supply of fresh air passes, a Bunsen burner being lighted beneath it in cold weather; and the outlet at the top is connected with about four feet of three-inch pipe, in which another burner can be lighted to stimulate the draught of air through the whole. Special precautions, of course, are taken to exclude all light when the door is closed.

So far this closet differs in no important respect from many others which have been described; but the special feature I desire to draw attention to is the series of shelves, twelve in number, which are so contrived that they may be separately levelled with great precision. To this end each shelf consists of a light iron casting in the form of two parallel bars, five inches apart, joined by cross-pieces at each end, and accurately planed on the narrow top edges, where the plates will rest while drying. In order to counteract any tendency to spring while under the action of the tool in the process of planing, there are likewise two intermediate cross-pieces. The shelves, with the ex-



ception of the lowest, which rests on the bottom, are supported, at a distance of three inches apart, on the points of ordinary wood-screws passing through wooden cleats, which are firmly screwed to the sides of the closet. There are two screws at one end, and one at the other for each casting to rest on; it is then easy, with the aid of a pair of gas pliers, to accurately adjust the level of each shelf separately, so that the emulsion will set and dry in an even film. The importance of having the upper edges of each pair of bars as nearly as possible level must not be overlooked, and it is advisable to paste a strip of white paper along their fronts, to render them more visible in the feeble light of the dark room, as no direct rays from the lamp or window are suffered to fall on the contents of the closet.

I should say that the credit for the excellent manner in which the castings I am now alluding to are turned out and finished is entirely due to an engineering friend—himself a photographic amateur, who, in fact, suggested employing cast iron for the purpose, from an economical point of view, in which he was fully justified in the result, as the cost of each shelf (for material and labour) proved to be barely three shillings.

In conclusion, let me say that I do not bring forward this system of drying as suitable for manufacturers on a large scale; but, for amateurs and others who, like myself, prepare comparatively small batches of plates at a time, I think the method will be found to possess some points of convenience.

The "Topic" for next week will be "A Brown Paper Studio," by C. D. Davies.

SOME SOLUBILITIES OF CHROME GELATINE.

BY MAJOR J. WATERHOUSE, BENGAL STAFF CORPS.

Cases sometimes arise in which it is desirable to entirely or partially destroy the insolubility in water of gelatine and other colloid bodies that have been treated with the chromic salts, and exposed to light, and in which a knowledge of the solubilities of such chromo-colloid substances in other menstrua than water may be useful.

So far as I am aware, the first investigations made with the object of finding a means of restoring the solubility of chrome-gelatine are those recorded in an interesting paper by Mr. J. W. Swan in the Photographic News, vol. xi., page 381, in which he fully describes some experiments he made to determine the nature of the chemical changes in virtue of which the mixture of chrome-gelatine acquires the property of insolubility, and, again, to see how far the solubility could be restored; resulting in the discovery that the insolubility of the gelatine was produced by deoxidising a salt of chromic acid in contact with it, and that its solubility could be restored by the action of oxidising agents, among which chlorine, permanganate of potash, and peroxide of hydrogen are particularly mentioned.

Dr. Eder has also recorded the results of his own and other workers' observations on this point in his classic "Researches on the Reactions of Chromic Acid and the Chromates on Gelatine, &c."

My attention was drawn to the subject in the course of some experiments made some years ago on the action of various reagents on chrome-gelatine films which were recorded in a former volume of the News, and I commenced a series of experiments on the solubilities of various chrome-gelatine compounds; but, owing to the demands of other work, I was unable to carry them out to the extent I had intended. The following fragmentary record of these experiments may, however, be of interest and use in the choice of solvents for, or means of swelling and contracting, chrome-gelatine films.

The experiments now recorded were made on a chrome-gelatine tissue, prepared by coating a waxed glass plate with a mixture of 1 ounce of gelatine and 30 grains of bichromate of potash dissolved in 8 ounces of water. The coating was allowed to dry, then thoroughly exposed to light on both sides, washed to remove all traces of soluble chromic salt, again dried, and then stripped off the glass. Small pieces of the tissue thus obtained were cut off and put into test tubes along with the various solutions tried.

Acids.

Muriatic, strong.—Dissolved in about an hour. Ditto dilute (twenty-five per cent.).—Swelled, lost colour, and dissolved in the course of about sixteen hours. When boiled in dilute acid, dissolved readily.

Nitric, strong.—Softened and dissolved readily. Ditto dilute (twenty per cent.).—Softened and dissolved slowly in the course of sixteen hours; dissolved readily on boiling.

Sulphuric, strong.—Dissolved slowly. Ditto dilute (ten per cent.).—Softened and dissolved in the course of sixteen hours. On boiling turned green and dissolved, but not so readily as in muriatic and nitric acids.

Phosphoric.—Swelled up and slowly dissolved in the course of sixteen hours. On boiling turned green, and dissolved.

Glacial Acetic.—Swelled up; did not dissolve after forty-eight hours' soaking, but was soft and pasty. On boiling, dissolved.

Citric, sat. sol.—Swelled up considerably in the cold solution, but did not dissolve after forty-eight hours' soaking. On boiling dissolved, but not readily, the solution turning of a purple colour.

Oxalic, sat. sol.—Swelled up and became pasty; dissolved in the course of sixteen hours. On boiling, swelled considerably and dissolved.

Tartaric, sat. sol.—Not dissolved after forty-eight hours' soaking; but soft and pasty. On boiling dissolved. The addition of a little bichromate of potash to the solution was attended with great effervescence, and the liquid turned of a purple colour.

Salts of Potash.

Caustic Potash, 1 to 6.—Dissolved in the cold, and readily on boiling.

Carbonate, sat. sol.—Slightly swelled, but quite crisp; turned green; did not dissolve after thirty-six hours' soaking; did not dissolve on boiling.

Chlorate, sat. sol.—Insoluble, cold or boiling. On the addition of muriatic acid to the boiling solution, the chrome gelatine dissolved immediately.

Bichromate, sat. sol.—Insoluble, cold or boiling.

Nitrate, sat. sol.—Swelled and softened considerably, but did not dissolve after thirty-six hours' soaking. On boiling, dissolved slowly.

Sulphate, sat. sol.—Insoluble, cold or boiling; not much swelled.

Permanganate.—Dissolved in the cold, with formation of brown deposit.

Binoxalate, sat. sol.—Swelled, and turned white, but undissolved in the cold after twenty-four hours. Dissolved easily on boiling.

Tartrate, sat. sol.—Swelled, and lost colour, but not dissolved after thirty-six hours; did not then dissolve on boiling. After forty-eight hours was nearly all dissolved, and on boiling dissolved entirely.

Cyanide.—Not dissolved in the cold after forty-eight hours. Dissolved on boiling.

Ferridcyanide, sat. sol.—Insoluble, cold or boiling.

Ferrocyanide, sat. sol.—Undissolved in the cold after twenty-four hours. On boiling, dissolved slowly.

Common Alum, sat. sol.—Insoluble in cold; dissolved readily on boiling.

Salts of Ammonia.

Bichromate, sat. sol.—Insoluble, cold or boiling.

Nitrate, sat. sol.—Insoluble, cold or boiling.

Muriate, sat. sol.—Insoluble, cold or boiling.

Oxalate, sat. sol.—Insoluble in cold after twenty-four hours. Turned white, and dissolved on boiling.

Sulphocyanide, sat. sol.—Did not dissolve in cold after seventy-two hours. On boiling, dissolved readily.

Salts of Soda.

Acetate, sat. sol.—Insoluble, cold or boiling.

Borate, sat. sol.—Dissolved after thirty-three hours' soaking in the cold. Did not dissolve readily on boiling.

Carbonate, sat. sol.—Soluble in the cold after fifty hours. Slowly soluble on boiling.

itrate.—Insoluble, cold or boiling.

hloride.—Insoluble, cold or boiling.

Hyposulphite.—Scarcely swelled, and insoluble after thirty-three hours' soaking. Remained the same on boiling.

Nitrate, sat. sol.—Insoluble, cold or boiling.

Phosphate, sat. sol.—Turned green, but insoluble, cold or boiling.

Metallic Salts.

Barium Chloride, sat. sol.—Insoluble, cold or boiling.

Barium Nitrate, sat. sol.—Swelled considerably, but insoluble, cold or boiling.

Calcium Chloride.—Swelled, but did not dissolve in cold. On boiling, dissolved very slowly.

Chrome Alum.—Insoluble, cold or boiling.

Strontium Nitrate.—Swelled very much, but insoluble, cold or boiling

Copper Chloride.—Swelled, but insoluble, cold or boiling.

Copper Sulphate.—Insoluble in cold, soluble on boiling.

Copper Acetate.—Very soft in the cold after six hours. Dissolved on boiling.

Iron, Perchloride (acid).—Not much swelled, and insoluble after twenty-four hours' soaking in the cold. Dissolved on boiling.

Iron, Perchloride (neutral).—Insoluble, cold or boiling.

Iron Sulphate.—Very little swelled after twenty-four hours. Insoluble, cold or boiling.

Gold Chloride.—Insoluble, cold or boiling.

Lead Acetate.—Swelled, but undissolved in cold after twenty-four hours. Dissolved on boiling.

Mercury Bichloride.—Insoluble, cold or boiling.

Platinum Bichloride.—Did not swell much. Insoluble, cold or boiling.

Uranium Chloride.—Partially soluble in the cold after forty-eight hours' soaking. Dissolved on boiling, but not so readily as in uranium sulphate.

Uranium Nitrate.—Insoluble, cold or boiling, after forty-eight hours' soaking. Did not swell much.

Uranium Sulphate.—Soluble in the cold after forty-eight hours' soaking. Dissolved on boiling.

A NEW DEVELOPER.

BY DR. EDER AND CAPT. TOTH.

Hydroquinone possesses such excellent developing properties that one naturally feels inclined to try those of its isomerides—pyrocatechin and resorcin, for all these substances have the same formula, $C_6H_4(OH)_2$, though they differ as regards both their chemical and their photographic action. Resorcin is readily soluble in water, and has no (or a very slow) reducing action on nitrate of silver in the cold; but with the addition of ammonia the reduction is much accelerated; ammoniacal solutions reduce also bromide and chloride of silver. Pyrocatechin is also very soluble in water, and is a more active reducing agent; it reduces gradually the nitrate of silver even, in very dilute solutions, to the metallic state, and deposits the silver more especially at those spots on the surface of the glass where there are are already portions of the metal. The precipitated silver has a blue-black colour. Ammoniacal solutions of pyrocatechin reduce with readiness not only the nitrate, but also the bromide and chloride, of silver. The further photographic properties are as follow:—

1. A delicate picture full of detail can be obtained on a wet iodo-bromised collodion plate, after it has been sensitized in a ten per cent. silver bath, and exposed in the camera, by flowing over it a solution of one per cent. of pyrocatechin in water; in this case there is no sign of fogging. A five per cent. solution acts more rapidly, but it fogs the negative, without materially reducing the length of the exposure; but the fog would probably be avoided by the addition of a little glacial acetic acid. The

plate must be exposed two or three times as long for the pyrocatechin developer as for the ordinary ferrous sulphate developer—consisting of 5 parts ferrous sulphate, and 3 parts glacial acetic acid in 100 parts water. The precipitated silver possesses an exceedingly fine grain, and is much darker in colour than when thrown down by ferrous sulphate.

2. A dilute solution of pyrocatechin, mixed with a few drops of silver nitrate, may be used for intensifying negatives, the same as the pyrogallic intensifier; if the solution be too concentrated, or the action be continued too long, reddish-brown spots will be produced.

3. When a dry bromide emulsion plate, after exposure in the camera, is treated with a five per cent. solution of pyrocatechin to which has been added ammonia solution—in the proportion of 2 or 3 drops to every 20 cub. cents.—an image is developed very full of detail. The exposure must be, however, a somewhat longer one than is required for the ferrous oxalate or the pyrogallic developer, and the development itself is somewhat slower in action. By increasing the proportion of ammonia to 6 drops the development is somewhat quickened, but fogging will make its appearance. Potassium bromide keeps the image clear, but considerably retards the developing process. When fixed, the negative has a greenish brown or olive-brown colour. Pyrocatechin in an alkaline solution acts much better as a developer for dry plates than it does for wet plates.

4. Resorcin is perfectly useless, either as a developer or as an intensifier, in the wet collodion process. On a wet plate, in fact, it will probably produce no image at all.

5. Silver bromide emulsion plates are not so readily developed with a 5 per cent. solution of resorcin as with a similar one of pyrocatechin; a solution of resorcin containing 6 drops of ammonia to every 20 cub. centim. was unable to produce an image, whereas the pyrocatechin developed a very good picture in the same time. By adding 20 drops of ammonia, and exposing for three times as long as is requisite for the ferrous oxalate developer, a clear but thin negative is obtained, which, by transmitted light, has a reddish brown, and by reflected light a greenish yellow, colour.

We have thus shown that all the isomeric bihydroxyl derivatives of phenol-hydroquinone—pyrocatechin and resorcin—can, with the addition of more or less ammonia, be used for developing dry plates of silver bromide; hydroquinone and pyrocatechin are the most powerful, while resorcin possesses a less energetic action. Further, that pyrocatechin plays a subordinate part as developer for wet collodion plates.

In conclusion, we may mention that the antiseptic properties of resorcin, which it appears to possess in common with carbolic acid, seem to render it probable that it might be used with advantage to prevent decomposition in gelatine emulsions. It is more readily soluble in water than either phenol, thymol, or salicylic acid, and does not reduce gelatino-bromide of silver.

Correspondence.

TRANSFER BY SIMPLE CONTACT.

Sir,—In your most interesting article "On the Transfer of the Visible and Invisible Photographic Image by Simple Contact" you say that my opinion, that in the case of gelatino-bromide of silver plates the action of light continues after exposure, is in opposition to the opinion of all other experimenters. In the article on Gelatino-bromide of Silver by Dr. Monckhoven, at page 596, the following occurs: "But by deferring the development too long it will probably happen that the effect of the light has diffused itself over the whole film." Now I take it that this refers to a similar continuing action to that observed by me, and therefore my opinion is not altogether unsupported. From my observations and experiments, I believe that this action varies somewhat according to the method by which the bromide of silver is produced.

The following may be of interest to those who are experimenting in this direction. Some gelatino-bromide plates were exposed during the day, and in the evening were taken from the slides and packed (I being on a tour, and having no convenience for developing). Inadvertently the film of the outside plate was in contact with a printed paper. About ten days after, when developing, I found that, besides my picture, I had a positive proof of a portion of the *Daily News* on the same film. Thomas Bates Blow.

OXALATE AS A RE-DEVELOPER.

Sir,—Finding some trouble in intensifying gelatine with mercury and ammonia, I thought I would try the effect of an immersion in ferrous oxalate, and found that it gave great intensification; applying afterwards the mercury and ammonia. Any amount of intensity seemed to be got. No fog, but a very non-actinic colour. I tried this with several plates, both negatives and transferrs, and succeeded with all.

I see in a contemporary that the writer of a letter on "green fog" alludes to the value of carbonate of ammonia for gelatine development. I shall be glad to hear if any of the readers of the News have tried it, as I suggested in your columns two or three weeks ago. It ought to give negatives with greater vigour and contrast.

Francis Turton.

WANTED, A WORD.

Dear Sir,—Mr. Palmer's letter rather strengthens my argument, and his quotation from Sir Joshua Reynolds confirms its correctness. Sir Joshua, in speaking of the picture of St. Sebastian, was not speaking of the Saint himself (who, if he sat at all, would have sat as the *subject* from whom the picture was painted), but of the *model* from which the imaginary portrait was copied.—Truly yours,

P. C.

Dear Sir,—In your last impression a letter appears with the above heading. Now whether *model* or *subject* would be the more preferable term to employ in place of *sitter*, it is not my intention to discuss. Possibly *object* would in many cases be more correct than either. The matter, however, is not of the slightest *actual* importance, because there is no word that will answer under all circumstances.

I fail to see, however, that your correspondent strengthens his case in any way by the last two lines of his letter. The "dragging in" of passages of Scripture unnecessarily is hardly to be commended; but, in any case, the quotation should be given correctly.—Yours truly, F. A. Bridge.

CLEANING OFF GELATINE PLATES.

Dear Sir,—Can you or any of your readers furnish me with a ready and efficient method of cleaning the gelatine films off waste dry plate negatives? I, in common with many others, am beginning to find these accumulate rather more rapidly than is desirable.—I am, sir, yours obediently,

Bromo.

Proceedings of Societies.

Liverpool Amateur Photographic Association.

The monthly meeting of this Association was held on Thursday, the 30th ult., at the Free Library, William Brown Street, the

President, Mr. J. H. T. Ellerbeck, in the chair. The minutes of the last meeting having been read and confirmed,

The Secretary reported that there had been three outdoor meetings of the Association—the first at St. Michael's Hamlet, where the members had enjoyed the hospitality of Mr. W. H. Wilson; the second at Wallasey, at the house of the Secretary; and the third at Wenlock Abbey, Shropshire. The last had been an especially enjoyable excursion, and had resulted in the production of a large number of satisfactory negatives of Wenlock and Buildwas Abbeys. The thanks of the Society were due to Mr. Gaskell for throwing open his grounds and the ruins of the Abbey to the members of the Association, and to Mr. Brookes, the well-known antiquary, of Wenlock, for his kindness in acting as *cicerone* at the ruins, also for his interesting history of the Abbey and of the magnificent oak carving in the Town Hall.

Mr. Edmund Phipps sent an account of his method of reducing the density of gelatine negatives, and also of removing ammonia stains. He employed one part of a saturated solution of chloride of lime to fifteen parts of water. This should be applied to the surface of the negative until the necessary result had been obtained, and then the film should be thoroughly washed. Negatives treated in this way were exhibited, and the result obtained was completely successful.

Mr. J. A. Forrest asked if any of the members had endeavoured to obtain local intensification by means of a camel's-hair brush and bichloride of mercury.

The Chairman remarked that he had employed that method for many years, and its success and usefulness were unquestionable. He then read a paper on "Simple Directions for the Calculation of Exposures" (see page 483), and exhibited some negatives in illustration of his remarks.

After some discussion on this subject,

The Secretary gave notice to the members who had joined in the Wenlock excursion that he would be glad to receive prints for the Wenlock bazaar on or before the 11th of October.

Mr. Forrest requested the Secretary to read to the meeting a paper on the gelatine process, by an anonymous friend. The writer gave the details of his method of making an emulsion, and of the preparation of plates therewith. The paper was eminently practical in its character; but the author did not authorise Mr. Forrest to make public his method of working with gelatine.

The Chairman announced that the Council recommended the selection of not fewer than twelve of the best negatives produced during the past year by members of the Association, and that prints from these should be distributed among the members in lieu of the usual presentation print.

A resolution to that effect was proposed by Mr. J. A. Forrest, seconded by Mr. B. Boothroyd, and passed unanimously, after some little discussion whether the prints should or should not be mounted.

The exhibits at the meeting were negatives and prints taken at Wenlock and Buildwas Abbeys, by the President, Rev. G. J. Banner, and Messrs. Bruce, Wood, and Day; a fine print of Wells Cathedral, by Rev. J. D. Riley; James J. Shew's changing-box, by Mr. Wm. Atkins; an enlarged quarto-plate gelatine negative, by Mr. W. H. Kirkby; some good prints from negatives taken this year at Tintern and the Wye, by Mr. E. Twigge; and some negatives of Switzerland, Italy, and Belgium, by the Secretary.

The meeting was then adjourned to the last Thursday in October.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

*** We regret that the Press Notices of the Exhibition compel us to postpone our "At Home" this week.

M. F. C.—The print is a collotype. Lichtdruck, Heliotype, Artotype, &c., are also names given to the process. Any good handbook should contain a description of the process. "Instruction in Photography," by Captain Abney, to be had of our Publishers, describes the process.

H. G. Sanford.—There are many dry processes, but it is probably the gelatino-bromide method to which you refer. See Photographic News, April 30th and May 21st.

George Thomas.—We do not know the photographs under that name. Do you mean the Ferrotype? This is described in our Year-Book of 1879.

G. Lewis.—Ordinary methylated spirit.

G. Barham.—1. Greater rapidity is likely to ensue from employing a small portion of the gelatine at first. 2. With equal digestion, No. 3 formula would give the slowest plates, but we do not say they would be the worst; in fact, if they are quick enough for your purpose, we should rather prefer the formula. 3. It is a ready means of injecting, but we could not recommend it as "the best"; we ourselves have employed the burette with perfect success. 4. Boiling from five minutes to twenty-five minutes is recommended by various authorities; we usually make two or three batches, varying the time, and mix afterwards according to results.

Arthur.—Bromide solution may be used as a restrainer with the oxalate developer just as well as with the pyrogallic. Employ one ounce of sugar to every four ounces of iron.

G. G.—Apply size over the surface of the plan first with a brush, and, when dry, coat it (also with a brush) with some transparent varnish, such as copal. If you varnish before the plan is dry, brown stains ensue.

"Flat."—You should have the means of more lighting at hand, even if you do not use it. As it is, your lighting is good—nay, very good—only there is not enough of it. We do not recommend a window on the south side, but rather another on the north, nearer the door, which will help with front light. Lighting is good both in No. 1 and 2, only it wants to be more accentuated; it is the negative which is at fault.

Henry E. Husson.—The paper you send must have suffered from damp, or is badly prepared. See Payne Jennings on printing and toning in the News for September 17; it contains sound practical advice on the subject. The print you forward has many good qualities, but it is a little over-toned. We congratulate you on your experience with gelatine. A good plate may "flash out" on development, but it is better to keep the development well in hand. Our Publishers will send you the News containing Dr. Vogel "At Home."

Little Nemo.—Your query shall be sent to the author of the paper, and then there will be no mistake.

Mezzo.—You might have a small fee to pay, but there would be no difficulty, and you have no occassion to be naturalized. The *Moniteur de la Photographie*, Quai Voltaire, Paris.

Novice.—In the first place, employ an old glass plate for the purpose, and not a new one. If you slightly rub the surface with talc prior to collodionising, you can then have no difficulty. Apply a coating of gelatine to your paper, and press this upon the image; when dry, the film should strip easily.

R. L.—No gelatine plate intensified with mercury is likely to last as long as silver intensified collodion negatives. At the same time, notwithstanding change of colour, they may be depended upon for a considerable period.

R. T. W.—The lack of colour is no proof of your materials being defective; mixed collodion rarely gets ripe and coloured in the time you mention. Your lighting is probably too weak. Try an experimental plate on a sun-lit object with black shadows; if you cannot then get opacity of the film, your materials may be at fault; but we doubt it, if you have followed formulæ.

F. N. J.—You have your developing water too warm, or you do not allow sufficient time to elapse between squeegeeing the print upon glass and its development.

A Reader.—Make a strong solution and add it as necessary. This precipitates the gold as well as silver.

F. E. F.—In last week's Photographic News.

Eton.—We are glad you like them. You will find we have anticipated you; the description of it will be given next week.

Nemesis.—There would be no discussion if every one were satisfied. We are not.

W. L.—If you will look back you will find we have described both Hills and Saunders, and Messrs. W. and D. Downey. Thank you for the hint as to the other firm; but we hardly think it is on a level with these.

Visitor.—They are exhibited by Mr. Werge.

Myra.—It means the focal length divided by that number.

Pencil.—Mr. H. P. Robinson will help you in art photography better than any advice we can give. Write to our Publishers.

Aaron.—He refers to collodion emulsion, and not gelatine; but the ammonia developer answers for both. Gelatine is the most sensitive.

The Photographic News, October 15, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

A Story of the Daguerreotype Days—A Photographic Swindle—Reduction of Old Silver Baths—The Permanence of Alizarine.

A Story of the Daguerreotyping Days.—The Daguerreotypes exhibited by Mr. Werge at the Pall Mall Exhibition are in strange contrast with the latest development of photography—the gelatine plate. Whether the latter can be pronounced the *omega* of the art we cannot say, but it is certain that the Daguerreotype is the *alpha*. When one hears of photographs being taken in the 150th of a second it sounds almost droll to read of an improvement some two-and-thirty years ago, reducing the exposure from *ten minutes* to five or six! And yet this was considered an achievement. And what curious ideas people had about sun pictures in those days? In an old American photographic journal, long since dead and forgotten, we find a comical story illustrative of this. An elderly gentleman called at the studio of a Daguerreotypist in one of the towns in the western part of New York States. Said the old gentleman, "I would like to get my Daguerreotype taken, and while I go down street to sell the old lady's apples, you may take it, and put it up in one of your two dollar cases, so when I come back I'll see how I look. Fix it up, as I'm in a deuce of a hurry." By this time he had got to the door to leave. "Sir," said the Daguerreotypist gravely, "you had better sit now." "Sit! What for? I'd have you to know, sir, that it's against my rules to sit down in the daytime. I'm one of your up-and-doing men. Sit! Not I, indeed. Can't stop." "But," explained the assistant, "it will be impossible for me to take your likeness unless you sit. It won't take you long." By dint of argument and persuasion, the old gentleman became at last convinced of the necessity of sitting, and accordingly took a chair, and prepared himself for, to him, some hocus pocus operation, taking the precaution to enquire if there was any chance of "them things bustin'?" The Daguerreotypist assured him there was not the least danger, and proceeded to arrange the camera, at the same time warning his customer of the importance of having a free and easy expression; then, exposing the plate the required time, observed, "That will do, sir; I have you now." The old gentleman arose, and stood for a moment speechless and amazed at the strange operation; at last, regaining his self-possession, he exclaimed, "I dunno how that'll turn out, Mr. Smith; but I'll think you'll find that in the first part of that likeness I looked a bit sober, but in the last part I kinder smiled!" After all, the public, as a rule, at the present time, we fear, have not a much better appreciation of the process which goes on when their portraits are taken than had this unsophisticated old gentleman.

A Photographic Swindle.—Photography is sometimes made to serve ignoble purposes. Not long ago some ingenious swindler in Mississippi made photographs of greenbacks, and circulated them in the back countries among the ignorant class of people there, as a new style of check issued by the Government. The *modus operandi* was to get them discounted; they then found their way into circulation, and eventually were paid into the local banks. Singular to say, even at the banks the fraud was not detected, probably because what with passing from hand to hand—and not very clean hands—folding and unfolding, and innumerable enclosures in leather pouches, they had become dirty, greasy, and generally undecipherable as the genuine greenback. However this may be, over 19,000 dollars' worth was sent to the Treasury for redemption, where, of course, the swindle was soon detected.

Reduction of Old Silver Baths.—German chemists have for some time past been experimenting in the electrolytic separation of silver from nitric solutions, and Herren Fresenius and Bergmann, following up the researches of Luckow, published in 1865, have greatly perfected the process. It had been long known that silver can be precipitated in a compact metallic state from the solution of silver cyanide by means of the electric current, but it is only recently that it has been effected with nitric solutions. Writing in the *Zeitschrift fur Analytische Chemie*, the experimenters state, in accordance with Luckow, that silver can be easily and completely precipitated from nitric solutions, whether neutral, or containing free acid, but that it is disposed to take a spongy or flocculent form, so that it easily falls off from the electrolode, and cannot be easily weighed. The precipitate assumes this spongy state especially when it has been deposited from a somewhat concentrated solution by the action of a moderately strong current. By using dilute solutions and a weak current, Messrs. Fresenius and Bergmann have succeeded in throwing down the silver in a compact state, adhering firmly to the electrolode, and capable of being readily weighed. This result, however, was only obtained in presence of free acid. From neutral solutions even a feeble current precipitated the film in a flocculent state. The following proportions are said to be suitable for obtaining the deposit of metallic silver in a compact form: In 200 c.c. of liquid submitted to an electrolysis there should be from 0·03 to 0·04 grammes metallic silver, and three to six free nitric acid, the electrolodes being at a distance from each other of one c.m., and the strength of the current such as to evolve 100 to 150 c.c. detonating gas. It is by no means unlikely that some process analogous to this could be used in photography for the reduction of old silver baths. The ordinary method of precipitation and reduction by heat is always attended by more or less trouble, and electrolysis is such an elegant process that, could it be used practically, it would have many advantages over the old plan. Of course, there is the question of cost, and here it is possible a drawback might arise.

The Permanence of Alizarine.—The paper read by Mr. J. R. Johnson at the Photographic Society some two years ago on "Alizarine, its Use in Carbon Printing," and the somewhat warm discussion which ensued thereon, will be well remembered. Mr. Johnson's paper arose from the statements made by Dr. Monckhoven, to the effect that carbon pigments containing alizarine were not permanent. The cause of the fugitiveness in the prints examined by Dr. Monckhoven was shown by Mr. Johnson to be due to the fact that alizarine, like a great many dye-stuffs, is not permanent alone, but must be combined with a due proportion of base. Mr. Johnson said in his paper:—"It is not sufficient merely to precipitate the alizarine from its alkaline solution by so much alum as is necessary for the purpose, for alizarine is precipitated by acids, and alum is an acid salt. The lake so produced may be very intense and brilliant, it may be perfectly insoluble in water, but if it be insufficiently charged with base, it is not the true permanent lake, but that substance mixed with a quantity of the uncombined colour which will yield to the action of the light. Hence it is not surprising, therefore, to find that certain photographic prints made with alizarine have been found to be fugitive, and so fugitive as to destroy the beauty of the tint and the intensity of the shade of colour." Alizarine promises once more to be a subject of interest, since a prize has been offered in Germany for the purpose of testing the permanence of indigo, alizarine, and other aniline colours when exposed to light.

"COMBINATION" OR OTHERWISE?

BY H. P. ROBINSON.

Shakespeare says:—

> "The sight of means to do ill deeds
> Makes ill deeds done!"

I fear I have sometimes quite innocently led critics astray by giving them a "sight of the means" of going wrong which they have eagerly appropriated and I have properly appreciated.

The knowledge that I sometimes make "combination"

photographs seems to induce those critics whose skill does not enable them to recognize whether a picture is produced by this means or otherwise, to jump to the conclusion that every picture I exhibit is printed from several negatives, and therefore not true to nature.

This conclusion arrived at, the next thing is to point out the errors I have committed and the stupid blunders my want of knowledge of nature has led me into! But they are not infallible, and sometimes select an innocent "one-shot" photograph, and clearly prove beyond all doubt that it is altogether wrong because it is a "combination." Years ago I exhibited a large composition the chief part of which consisted of four figures. One of those ingenious critics who know everything and could easily discover every joint in your armour or picture, wrote at great length to prove that these figures did not agree with one another in lighting, in perspective, or in any other way, and that each figure was taken from a different point of view. Now the fact was that this group was taken on one plate at one operation, and the lighting, perspective, &c., must have been right!

The same thing is happening now, and always will until critics give up relying on foregone conclusions, and obtain a clear knowledge of what is right or wrong, possible or impossible in nature, or confine themselves to stating their opinions only, instead of misleading themselves and their readers on matters of fact. In the present Exhibition I have two pictures—"In Maiden Meditation Fancy Free," and "Dorothy." Many people have doubted whether they are combination or not; but one critic, at least, is quite sure they are, and pounces on them accordingly. Of the first named he evidently thinks the figure was taken in the studio. He suggests that the lighting is "too much from the top;" he says, "there is a false light somewhere, as a comparison of the shadows on the figure and those on the two tree-trunks in the background will show." (The combination—a false one, too—is proved, you see!)

In some things critics can see much further than in others, and have a detective eye for all sorts of unnatural faults, impossible lights and shadows, and false perspective; but sometimes again they cannot see an inch. It would be impossible, for instance, for them to imagine such a thing as another window or other source of light in a room besides the one represented in a picture. About "Dorothy" the critic enters into elaborate proof that the lighting is all wrong:—

"In 'Dorothy' we may also point to the lighting. The general character of the picture is very pleasing . . but then comes the *bete noir* of 'composition' photography—the lighting. The picture represents a girl leaning on the wainscoting of a window, which is the only apparent source of light in the apartment—at any rate, the picture does not lead us to suppose there is any other. One side of the face is strongly lighted, but the shadow side is, to our idea, far from being sufficiently in shadow. The proximity of the figure to the window would in nature entail very heavy contrast, certainly more than exists in the picture before us; besides which, a marked shadow of the head would be thrown upon the white handkerchief which covers the shoulders of the figure. Then, again, if the furniture and accessories be examined, we shall find some serious vagaries of light, the shadows running *to* the light, or in any direction but *from* it."

After all this conclusive proof that they were printed from several negatives, how can I ask anybody to believe that each of these pictures was taken on one plate only, at one operation, and that both are entirely and wholly unsophisticated; that "In Maiden Meditation" was taken in the open air without any "dodging;" that "Dorothy" was taken in the black-oak wainscoted drawing-room of one of the most delightful and picturesque old halls in North Wales without any alteration whatever of the light; and, if I must descend to details, that the exposure was only twenty-five seconds?

Now to confess my sins. I own that I cut away a small branch and removed a few bents of grass that were in the way when I was about to take the one picture; in the other I moved a chair and a table, and, if I remember rightly, I added some roses. In both I was guilty of the enormity of altering the dress and posing the figure of one of the most charming models I ever photographed. This was all! If the critic is right, and the light and shade was wrong, then nature knows nothing of her own business.

At Home.

AT MR. BUTTER'S PHOTO-LITHOGRAPHIC ESTABLISHMENT—THE VELVET ROLLER.

The subject of photo-lithography is one that at first sight may appear to have limited interest to our readers, and we should have hesitated, probably, in devoting an "At Home" to the matter, were it not for the fact that we have a novelty to discuss at the same time. It is a novelty, too, which interests not only the photo-lithographer and the collotype printer, but every photographer who is conversant with bichromate or pigment printing. We mean the introduction of the velvet roller.

Three months ago we pointed out, in these columns, certain improvements which had recently been made in the Government map-printing establishment at Vienna, where the ordnance maps are all produced by photo-lithography, the most important of all being the use of a velvet roller for the purpose of inking up the bichromate print and converting it into a transfer. This last innovation has now been made in the photo-lithographic establishment which Mr. Butter organized some years ago at Woolwich, and which produces work equal to any in the Kingdom, if not in the world. The process seemed to us so beautiful and, at the same time, so simple, that we feel sure the readers of this journal will be willing to listen to an account of our visit.

Mr. Butter has so recently given a succinct account of the ordinary routine of the establishment,* that we need not refer again to the older method of working; but we must first say a word about the taking of the negative. Here is the studio—a lofty glass-house—in which the negatives are secured, and running down the middle of it is a little tramway. The rails are some twenty inches apart, and upon them run the castors of a heavy oblong table; the table carries the camera, which is in this way advanced or retired without difficulty, a few simple wedges fixing the castors as soon as the necessary focus has been obtained. Under ordinary circumstances a spirit-level would be necessary to see if the camera is truly horizontal, and a plumb-line to ascertain if the drawing-board, upon which the plan to be copied is stretched, is quite perpendicular; but with the assistance of suitable fixtures such testing is no longer necessary. The camera table as it runs along the rails is known to be properly adjusted, and the solid board fixed upright at right angles to the tramway is always in position. This upright board is covered with a sheet of white paper, in the middle of which is a tiny cross that marks the centre or axis of the lens.

Here is a drawing ready for copying; it is on tracing-paper, and we remark at once upon its greyish tint. "Is the ground white enough to give an opaque film?" we ask. "When it is backed with white cartridge paper it will be," is the reply; and having first provided it with this backing, the tracing-paper is fixed by means of drawing pins before the camera. The sheet measures three feet, and the photo-lithograph is to be twelve inches. There are fine lines and broad ones, dotted lines and delicate curves, but they seem to give no difficulty. The focus is taken midway between centre and margin of the picture; the lens, by-the-bye, being a rectilinear of twenty-six inches equivalent focus. A short exposure is given, and the delicate grey image, with its transparent lines, is then treated with Eder's lead intensifier, which is described in Mr. Butter's paper, and which renders the ground of the negative as "black as your hat."

We are now taken in hand by Mr. Baker, the chief

* See Photographic News for March 19th, 1880.

draughtsman of the establishment, under whose immediate charge the work of photo-lithography is conducted. "We have come to see the velvet roller process," we tell Mr. Baker. "It is so promising that it bids fair to oust the older process altogether," is his reply; and in confirmation of his opinion he exhibits a series of prints that have been pulled from the stone from a transfer just made.

The sensitizing room is a small apartment with one large window, of which the lower half is darkened by a shutter, and the upper hung with tammy. Here the paper is sensitized. Only Bank Post is employed, a very tough and smooth material. "There are two kinds of Bank Post," says Mr. Baker, "one having parallel lines running across the sheet, and this is of no use whatever in the process." The paper is floated upon the bichromate and gelatine mixture*—one coating is usually sufficient, if it is skilfully done—and, when dry, exposed under the negative in the shade. Five minutes' printing is ample in the summer time, if the lines of the negative are pure and clear; but the time can only be well judged by an experienced printer. When looked at in the dark-room, the faint brown marking of the image on the yellow paper is scarcely perceptible, and for this reason it is well to mark the face of the paper with a blacklead pencil immediately before sensitizing.

We have now before us a bichromated-gelatine print, and we are going to treat it by the velvet roller process. It is handled very much like carbon tissue that has just been printed. Mr. Baker throws it into cold water, and allows it to remain immersed for four or five minutes. He now takes a glass plate, rather shorter than the print, so that the ends may tuck under, and puts the impression carefully on the glass surface. The operations may henceforth be conducted in the light, for as soon as the print goes into cold water, you need be under no apprehension of spoiling it by daylight. The wet print is squeegeed upon the glass plate, and the superfluous moisture further removed by lightly laying upon the surface a sheet of bibulous paper. "Let the print be too wet, rather than too dry," says our friend the chief draughtsman, as he carries it off to the lithographic room.

Here some ordinary re-transfer ink has been considerably thinned with turpentine, and well rolled upon a slab with an ordinary leather roller. A burnished steel plate, close at hand, is now coated with a fine even surface of the dilute transfer ink by the application of the same roller, and then the velvet roller is taken in hand. This is passed over the steel plate to take up the ink, and then delicately rolled over the bichromate print. The ends of the print being double under the glass plate, it is kept flat and firm, and, to allow the lithographer sufficient play for his hands, the slab on which the glass plate rests is no larger than necessary for the purposes of support. At first the velvet roller is passed lightly over the surface, but some weight is afterwards borne upon it. "You see, I treat the paper print precisely as I would a stone," said the skilful lithographer, and he certainly did. The bichromate print was sponged and rubbed, and rolled and watered, just as if it were a lithographic stone, and in a few minutes the blank sheet of paper, which at first bore but the faintest of brown markings, was covered with fine black lines of the most exquisite sharpness—a design in miniature of the original drawing. Continued rolling up—carried out, be it remembered, by a skilled lithographer—brought more of the viscid black ink upon the lines, and in a quarter of an hour (for very little cleaning was necessary) the plan was ready for transferring to stone. When wetting the paper is undesirable, breathing upon it will often impart sufficient moisture to the film to enable it to repel the ink from the roller. Before applying the finished transfer to a warm lithographic stone, it is well washed in cold water to remove the superfluous gelatine from the surface.

"In the older process, you will remember," said Mr. Baker, "the inking-up had to be done in the dark, and there was the necessity for a supply of warm water, maintained at an even temperature." The chief draughtsman added that the lines produced by the velvet roller seemed to him both finer and less given to rottenness, while the process took up less time. The fact, too, that the lithographer could work at the simple bichromate print, as it came out of the pressure frame, as if it were a stone, was a point, the importance of which, could not very well be overrated. Mr. Baker has, indeed, found it possible to pull copies from the bichromate print in the lithographic press, and is sanguine about simplifying the photo-lithographic processes still further by thus employing the photographic impression on paper as a printing block instead of as a transfer.

That the Collotype printer will be able to make good use of the velvet roller is but a matter of course, in manipulating the film in the first place, when very tender treatment is necessary; while we cannot help thinking that this useful appliance may open the door to photographers who are conversant with bichromate printing to practise a simple photo-lithographic or collotype process. Only some knowledge of and practical skill in lithography are, obviously, necessary.

* For details in this respect, we refer the reader to Mr. Butter's paper above quoted.—Ed. P.N.

The "At Home" for next week will be "Mr. Robert Faulkner at Baker Street."

HOW THE SWANS WERE TAKEN.

BY MESSRS. MARSH BROTHERS.

The story is soon told. There were two main difficulties to be overcome, apart from those of a photographic nature, and these were to accustom the swans to come to a spot favourable as to lighting and locality, and to familiarise them with the sight of camera and apparatus. In a word, they required education. In taking boating parties with the wet process, we had once or twice succeeded in getting some swans near the boat, and being impressed with the beauty of their appearance in the photograph we naturally thought that with a quick shutter that would work without vibration, and extra rapid dry plates, some swan pictures might be successfully secured.

The first thing was to take note of the haunts of the birds, and to choose the most favourable of these spots, having regard for the time of day at which we proposed to take the photograph, so that the lighting should be all that was desired. Having selected the spot, the birds were fed regularly day after day at the time we had fixed upon, as many loaves as would keep a small family for a week being expended in the endeavour to entice a goodly number of swans to the neighbourhood. Unfortunately, swans are not blessed with an amiable temper, and are never on good terms with one another; the consequence was, we had the greatest difficulty in getting them close together into a picture, the sole aid in grouping being afforded by pellets of bread thrown into the tide at opportune moments. We focussed on a given point, and waited patiently for the best chance to expose the plate. A more obstreperous party of sitters no photographer has ever had the grouping of, but by continuous and judicious feeding we managed at last to get through our task. Rapidity and absence of vibration in the shutter used was a *sine quâ non*, and we have much pleasure in forwarding for your inspection the instrument we made use of.

[The shutter used by Messrs. Marsh Brothers consists, in the main, of a large disc of cardboard, which revolves on its axis. At one portion of this disc there is a round opening of the size of the lens, so that the disc in revolving uncovers and covers the lens. As a matter of course, the more quickly the disc revolves the more rapid will be the exposure. Messrs. Marsh Brothers, by the simple employment of india-rubber bands of various elasticity, are enabled to alter the speed at which the disc will revolve when released from its catch. The ingenious shutter ex-

hibited by Mr. Cadett at the Exhibition is designed somewhat on the same principle; Mr. Cadett, however, does not have a round opening upon the margin of his disc for capping and uncapping, but one in the shape of the segment of a circle. The latter is manifestly an improvement, albeit at first sight it may appear but a trivial one.—Ed. P. N.]

HOW TO REMEDY A DEFECT IN GELATINE FILMS.

BY EDWARD DUNMORE.*

As the working of gelatine plates in some form or another is the most absorbing topic of modern photographic practice, the results of any experiments tending to throw light on the matter will probably be acceptable.

The particular trouble we will now discuss is "pitting"—that peculiar and annoying defect associated more especially with the use of Coignet's gelatine, which, save and except this drawback, is one of the most promising samples of gelatine we have to choose from. I was for a long time under the impression that this defect was not to be remedied (the cause being grease or some peculiar compound inseperable from the gelatine) unless eliminated by some elaborate process that would be so troublesome as to be practically out of the question with the generality of amateur plate makers. Having, however, heard that a remedy had been found, but which is still, however, a secret process, I instituted a number of experiments with the idea of finding out the cause and overcoming the difficulty.

To ascertain the reason of these depressions termed "pitting"—and no better term could be used—was my first care, and in this manner I attempted to solve the problem:—A small quantity of emulsion was made, entirely of Coignet's gelatine—a sample that had invariably given a great number of spots; this was placed in a beaker in a pan of water, which was kept boiling until the emulsion attained about 200 degrees of heat. It was then removed from the pan and allowed to cool to about 100 degrees. A cold plate was now coated, and the process of setting closely watched. A sort of effervescence, if I may so term it, seemed to take place as soon as the emulsion was flowed over the plate, and each bubble of air or gas as it expanded and burst caused an indentation, which the fluidity of the emulsion soon made level; but as the gelatine commenced to set, these bubbles that were continually being liberated, caused depressions that the thickened emulsion failed to flow into, leaving an irregular surface. At length the emulsion became sufficiently solid to retain the bubbles wherever they were generated, and as it dried, the gaps thus formed were permanent, and caused pitting - the larger the bubble the deeper the pit, and consequently the larger the transparent spot on the dried plate. Undoubtedly the same process is gone through with other gelatines; but their fluidity is so much greater, or their tenacity so much less, than with this particular sample, that the air-bubbles are readily dispersed, and the emulsion flows into the spaces, and makes a level film. I have no doubt in my own mind that the bubbles are caused by air engendered by the agitation, and by the boiling an emulsion is subjected to; but, instead of being dissipated, and in limpid fluids, are retained, and, when poured out in a thin film on the glass, there is less resistance, and they at once commence to liberate themselves during the time the gelatine remains sufficiently fluid.†

The subdued light in which the preparation of plates is carried on, together with the creaminess of the emulsion itself, prevents small air-bubbles being observable, and with other gelatines of a softer character produce no harm.

This, then, being the theory of their formation, two plans suggested themselves as remedies—one was to heat the plates and retain them at a temperature sufficient to keep the emulsion fluid upon them for a lengthened period; and the other the addition of inert or antiseptic substances that would in a measure retard the setting of the film until all air-bubbles were eliminated, and also stay incipient decomposition. I found, upon trial, so long a time was required to get rid of the bubbles by the first, that if I could succeed with the second process it would be an advantage. After making one or two additions for trial, I selected glycerine and acetic acid as most suitable, and found by adding a drop or two* to each ounce of emulsion, and using the plates tolerably warm, the defect of "pitting" was entirely mastered, and that Coignet's gelatine can be used without any of this objectionable defect putting in an appearance.

Whether these additions will have any deleterious effect upon the prepared plates I am unable to say. I should be inclined to think they will not. Of course the drying will be somewhat delayed but not to such an extent as to render its use objectionable. However, this, no doubt, will soon be put to the test, and I hope will stand it satisfactorily. In all probability other substances—sugar, for instance—might be used instead of glycerine; but at present nothing seems likely to be more convenient and innocuous than pure glycerine and acetic acid. As these seem to answer, it is scarcely worth while to look about for other substitutes.

Opaque spots form another source of trouble, appearing or being absent from different batches of emulsion made from the same lot of gelatine. A similar appearance is produced when moist sugar is boiled with a small quantity of water for a certain time and poured to set on a slab. More or less boiling will entirely prevent this appearance. In making a medicinal sweetmeat this effect is the sign of proper preparation. It is not unreasonable to suppose that the length of time or amount of heat the emulsion is subjected to may be the cause. If so, the remedy is obvious; anyway, this seems a parallel case.

In this short paper I have not alluded to spots from extraneous causes, such as dust, &c., but merely to defects that seem to exist in the material itself.

* Read before the South London Photographic Society.

† Since this was written, Mr. A. L. Henderson tells us he subjected a solution of Coignet's gelatine to the action of the air-pump, and that before the receiver was exhausted a very considerable frothing up occurred - so much so, that air was admitted to prevent it overflowing the containing vessel. On the admission of air the frothing up at once subsided. This experiment proves that a considerable quantity of air *is* imprisoned in a solution of this gelatine.

* Formula:—Acetic acid, five minims; glycerine, two minims; emulsion, one ounce.

ODDS AND ENDS ON ART—A DIALOGUE.

BY ALEXANDER S. MACKAY.†

Alastor—*a Painter.* Philip—*a Photographer.*

A.—Good evening, Philip; I am glad you have called. I have just returned from a stroll into the country, and am inclined for a rest and talk with you. What have you been doing? I hope you have been turning the recent beautiful weather to account?

P.—To a certain extent I have—with what success I leave you to say. Here is a photograph of an old gentleman taken a short time ago.

A.—An admirable head, and you have managed it very well; but, if you will allow me, there are some things I should like to suggest regarding portraiture, which are also applicable to that branch of photographic art.

P.—You are aware of my inexperience, and I will gladly receive any hints you can give on such a subject.

A.—A leading characteristic of all good portraiture is simplicity of arrangement. The aim of the artist should be to paint men and women, and not to give particular prominence to the objects around them. You must have observed that high lights in a picture are often valuable in proportion to their scarcity. The chief light is concentrated on the head, and the receding extremities of the figure fall more or less into half-tones. In this portrait you have too much sparkle about your curtain, table-cloth, and chair. Let your accessories be of the simplest kind, and so well subdued in tone as to come dimly out in your work. Your background, too, might with advantage be a good deal darker, and of a cloudy nature, something you can see into, and always endeavour to lose part of your outline in the background; this gives a peculiar charm. Let me observe, also, that in this photograph the reflected lights on the shaded side of the head are a degree too strong. Such lights, when dimly seen against a deep background, give fine feeling; but there is a danger of their giving a set expression to the eyes of your subjects. It seems to me that this background would be well adapted to portraits of ladies in light dresses; in them contrast should never be too strongly expressed; they are generally finest in well-graduated mezzotint. Let me now say, I should like you to experiment a little more with you light; try the effect of letting it come through a smaller aperture in your glass house; by so doing I am convinced you will get quality. In passing along the streets, I take an occasional peep into photographic cases, and while seeing much to admire, there is also a good deal to condemn, and which seems to me the result of positive carelessness; for instance, I see backgrounds with screens so off the perpendicular that the place

† Read before the Edinburgh Photographic Society.

seems crashing about the ears of all concerned. I also note in some quarters a passion for scenic backgrounds, with elaborate balustrades, balconies, pillars, pilasters, &c., &c. I don't object to these when well introduced, but often they are not so; besides, they invariably come out in a light tone. Why should they not be painted in those tones that come dimly, such as dull yellows, browns, or reds, instead of the pale grey they usually are? As such they should be discarded. I read some time ago, in a popular Edinburgh journal, a paper on the wonderful strides photography has recently made; but, no doubt, much has still to be done. Of course I apply this remark generally, as I cannot for a moment deny that here and there, and now and then, I have seen many very fine productions, which is a proof that the thing can be done, and "where there is a will there's a way." I would say to you, never, if possible, pander to corrupt tastes; in whatever you do, let it be your earnest desire so far to satisfy yourself, and you cannot fail to lead up the public to a proper appreciation of what fine art really is, and with that purpose in view a little gentle remonstrance with the said public might occasionally not be out of place.

P.—I understand your remarks, and shall charge my memory with them. Speaking, however, of light pictures, I must admit that I am somewhat partial to them, provided I could at the same time get power.

A.—In light pictures you may get much sweetness, and with delicate subjects in hand, well diffused light may be a necessity; but I am of opinion you can only get power from strong contrast of light and shadow. I should say that in strongly marked male heads this is indispensable.

P.—I told you recently I was going to the Highlands: while there I had leisure to take a few landscape impressions. Here is one taken under a cold grey sky.

A.—Ah! This is of a higher class than your portrait; you have here got massiveness. Now, just observe what value that fragment of rock gives to your foreground. Why, it gives that concentration inseparable from unity. What a very pleasing range of hills, with the quiet dip of the lake underneath! The old shieling, with its solitary ash tree in mid-distance, too, comes in well, and superadds a human interest to the scene. Be sure and always place your camera near some object or objects that will strengthen and give point to your foreground, as you have here done; by so doing you will avoid sectional feeling. I have seen numerous photographs, otherwise good, rendered almost useless as pictures for want of this quality, when with but slight trouble objects might have been found almost at hand. Let me see, this other is also very good; those Highland streams, with their bouldered and gravelled channels, always come up strongly. That bosky vegetation on the right bank is in fine form, and gives a pleasing feature to the composition. I notice something would have come in on the left here had you turned your camera slightly, and, as I believe it would have improved the general arrangement, I think you should never overlook such chances. Let me further remark, that in all your landscapes, give as much atmosphere and distance as possible. We delight in the sublimity of far-reaching space, and great masses of sky breathe of the infinite. Our earlier painters often gave two-thirds of sky to one of land or water. In mountain scenery this cannot so readily be done; but distant mountains partake of the skyey influences, and reduce the bulk of mid-distance and foreground. Landscapes with little background invariably speak of the earth, earthy. I think, too, that landscape photographers should choose cloudy weather for their purpose; they would thereby get mass, and beautiful effects are often obtained from the play of stray sunbeams through the rifted clouds, and it is surely a matter of importance to have well developed skies. I like these works of yours very well. You seem to have an eye for the picturesque, and you might well devote more time to landscape art. I can scarcely conceive of a greater pleasure than in being much with nature in the fields and woods. You see, Philip, I am very plain with you; but who will be true to each other if old friends are not? It is a great matter to be put in the right direction, and even then, to be ripe and good at anything worthy in science or art, we must exclaim very often, with the witches in Macbeth,

"Double, double, toil and trouble."

P.—Have you read Mr. Neilson's last paper?

A.—I not only heard him deliver it, but have since read it, and with very great pleasure; it embraces almost all that can be said upon the subject. Mr. Neilson has a healthy intuitive perception of all that goes to the making of a fine picture; besides, the graces of his literary style give an infinite charm to his papers; they possess the beautiful qualities he urges upon painters and photographers to adopt.

P.—I quite agree with you; but there are one or two passages I am not very sure I quite understand; for instance, what do you think he means by art and nature being in some respects opposed to each other, as when an "artist portrays a mile of nature on a foot of canvass"?

A.—I take him to mean precisely what he says; that is, that no artist ever can give the actual dimensions of nature; he can only do so relatively; and having an approximate idea of the bulk of nature, pictures appeal to our sensibilities chiefly through the medium of the imagination. My own opinion is, that it matters little on what scale an artist represents nature; he should have the skill to express some idea of its magnitude; but however well it is done, it is still likeness in unlikeness. Let me try and better explain myself. Some years ago, early one morning, I stood at the opening of a great valley or strath, the fountain head and cradle of one of our noblest rivers; save the bleating of young lambs and the sighing of the wind through an adjacent wood, there was nothing to break the eternal silence; from the swelling hills on either side, long sweeping lines ran towards each other, and almost merged on the banks of the young stream; and still on and on for many miles until lost in extreme distance, did those lines more or less repeat themselves in wonderful variety and harmony of form, until they became indefinite; while over all bent a sky infinite in its ever-changing splendours of lapis lazuli and silver. Now, what gave this scene its impressiveness, but its gigantic dimensions? I would ask, could an ordinary canvass represent this scene in its solemn expansiveness and repose? Any representation of it would be likeness in unlikeness with a will. In portraying nature, however, the larger canvasses have the better chance. In our National Gallery here, Etty's large pictures of the Combat, "Beniah," the story of Judith and Holifernes, and, let me add, Roberts' great picture of Rome, are much more impressive than had they been mere cabinet pictures. May we not say with truth that all subjects either over or under the natural size are by that difference unlike nature? I am here led to remark that successful portraiture on the scale of life comes, perhaps, as near to nature as any other branch of art. We feel this in all our Galleries, and I think it was strongly evidenced in the fine collection of Raeburn's work shown here some time ago. We felt then the impressions of fine art in its highest attributes of character—dignity, massiveness, unity, repose, variety, and harmony. In Raeburn, as in all great masters, we find the abiding element to be strength, with great breadth, where light is united to light, and shadow to shadow, and all accessories kept in their subordinate and proper places, not out of sight, but so blended and interfused in the general effect, so floating, as it were, in a darkness visible, as to gratify without wearying the eye. The eccentric Fuseli said of Lawrence's portraits, that they "sparkled like the objects in a tinsmith's shop." No doubt Sir Thomas in his later works departed from his earlier and broader manner, and being *par excellence* the painter of beauty and fashion, he also departed in some measure from the easy grace and dignity of nature, in his female portraits especially. He was too courtly in his manners not to yield to the gentle pressure put upon him by high-born ladies, hence the small waists, hands, and feet, with which we are familiar; his pictures too, sparkle with quite a profusion of jewellery. I need scarcely say that all this is to be deprecated, as pictures destined to endure should be as little as possible subject to the vagaries of fashion. Draperies should follow very nearly the outlines of the human figure as seen in sculpture. Diana in a hoop petticoat would be as ludicrous as the Appollo Belvidere in the most graceful inexpressibles and a swallow-tailed coat. With respect to the draping of the figure, I have often admired the courage of our older painters. I once saw a whole-length of a lady by Reynolds—a lady of high birth and long descent—painted in an ancient Greek or Jewish dress, slashed aside from the thigh, leaving the well-rounded and beautiful limb exposed to the sandalled foot. The best portraits of children, too, by the same artist are those least draped. A few years ago I saw by Raeburn two portraits of well-grown boys painted almost in the state of nature, and in beautiful form. Who, it may be asked, among all the artists living now, would dare to do that? But Reynolds and Raeburn were much above popular clamour. Now-a-days it is reserved for the dexterity of the milliner and dress-maker to efface the dimpled beauty of chubby childhood, and the more severe yet rounded graces of early youth. *(To be continued.)*

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A CAMERA FINDER.

A DELUGE of instantaneous shutters has befallen the land, and, faulty as many of them undoubtedly are, there now seems a prospect of the photographer securing a fit and proper instrument for rapid gelatine work. But he requires something besides a quick-working shutter, if he is going to occupy himself with instantaneous photography; he stands in need of a tell-tale, or finder, as the small optical instrument affixed to the larger one is usually called.

It is an undoubted advantage to be able to expose for the briefest of periods, and this, too, without vibration; but unless you expose precisely at the proper moment, all the ingenuity expended in the design of your shutter is in vain. A passing vessel, a flight of birds, a breaking wave, a gleam of sunshine, an exploding torpedo, may-be a horse-race—the successful depiction in the camera of these depend quite as much upon choosing the proper moment, as in giving rapid exposures.

We all know how small telescopes are fitted to big ones to assist in finding the object to be looked at; the finder camera, in the same way, is a small camera affixed to the larger and working instrument. So long as the two cameras are fixed parallel on the same base-board, there is no need to occupy oneself at all with the smaller one, which is but a very simple affair, the lens being of an inexpensive nature, and one that is always sufficiently in focus to require no adjustment. The cost of such a lens and camera is, in fact, only a matter of some shillings.

The value of a camera finder is very evident. Since the large and small cameras depict the same image, you have, after introducing the dark slide, a ready means at hand of watching for the eventful moment. If it is a passing vessel, you wait until this appears in the middle of the field of the smaller camera, and then expose, feeling quite sure that the ship occupies the same position in the working camera. When you change the lens of your working camera, or the plate, the field of the finder must likewise be altered; but this is easily done. Some squares of black paper, or thin metal, are at hand, having openings of various sizes, and these are fitted over the focussing screen of the camera-finder to enlarge or reduce the field, in accordance with the lens or plate in the working camera. These little screens are easily cut out, their size being determined by actual experiment with the working camera.

Camera finders are no novelty. They were always employed by Window and Bridge for the taking of cameo photographs, and are also to be met with in military and balloon cameras. Their employment, besides being useful as a tell-tale, has the advantage of avoiding haste and bustle just when it is particularly important that the photographer should be cool and collected over his work.

A SECOND VISIT TO THE EXHIBITION.

MR. W. J. A. GRANT, who has already taken a medal for Arctic photographs, sends a series of views of the "Second Dutch Arctic Expedition of 1879" (3, 17, 30). The first frame contains several vivid scenes of Arctic life; there is the embodiment of solitude in the picture of the ship surrounded by melting ice-floes, while the gloomy isolated mountain, washed by a black sea, is as good a representation of desolation as could be conveyed to the senses. The other frame includes brighter sketches, while No. 30, representing the deck of the *Willem Barents* under sail, is a picture taken from the fore topmast, giving a wonderful bird's eye view of the craft. Mr. Charles Sands shows a fine view of St. Paul's (2), taken from the river, and the Ferry Boat Inn, Tottenham, which would have been all the better for a little less foreground. Mr. Vernon Heath exhibits several foreground studies (1, 7, 16) of marsh, bramble, and furze, No. 7 being especially fine, by reason of the mixture of undergrowth, which is rendered with much taste and photographic skill. The Hermit's Tree (22), in which the outline of a human face may be traced, is a bold rendering of a quaint beech trunk, and the "Queen of the Forest" and "Sentinel" (31, 32), also by Mr. Heath, are two graceful Scotch firs, that make a pair of very effective pictures.

Of Mr. Gale's contributions we have already spoken; he has this year a large series, and of these No. 5, "Granville Smacks, Early Morning," two dark sailed craft off the pier-head in the cold dawn, is not the least pleasing. "Old House at Dol" (No. 295) looks like a quaint little engraving, it is so well conceived and finely executed. Mr. S. Samuels sends "Barnet Fair" and "Railway Station" (8, 9). Of Mr. F. G. O. Stuart's contributions, we prefer the "Crystal Palace" (72). Messrs. James Valentine and Sons send a collection of pictures illustrative of "Tay Bridge Accident" (11), which gives a most vivid and terrible impression of the disaster; the broken girders, torn iron-work, and shattered piers speak graphically of the camera as a powerful witness. A series of Scotch views are also shown by Messrs. Valentine, together with "Studies of Trees" (114), a silver birch growing out of a clump of delicate ferns being a delightful little picture. Mr. Renwick is represented by "Hoar Frost on the Trent" (19), which is unfortunately hung too high for inspection by ordinary mortals. Mr. T. M. Brownrigg sends several landscapes (20, 261, 264), and some wonderful instantaneous exposures; "The Pilgrim's Path Near Chilworth" takes our fancy most. Mr. E. S. Baker sends "Returning from Market" (21), a composition of five negatives, betokening much thought and considerable skill. The country road in the distance is one of the best points in the picture, which is somewhat marred by an absence of motive in the figures. A "Worcester Lane" (65) is a bright and pleasing study.

Lieut. Darwin, R.E., has five pictures. The Matterhorn (27), in which the sharp pinnacle is seen piercing a cloud of fleecy white; and a valley side, with its quaint wooden chalets, black firs in the foreground, and snow-hooded peaks beyond, are those that especially please us. Mr. K. P. Brown (28) has some nice little bits from the Thames, and Mr. Spiller (29) shows four pictures from the Isle of Wight, including King Charles's Window, Carisbroke Castle, and a portrait of Jack the wonderful donkey, which, like Tennyson's brook, "goes on for ever." Messrs. Newnham and Co. have a series of studies and portraits which include some very good work. Mr. Dunmore has two frames of sketches; "Richmond Bridge" (44) is a beautiful picture, clear and soft to a degree. Mr. Samuel Fry supplies a picture of a summer pic-nic on the Thames, and another of a boat adrift in the frozen tide, illustrative of "The Thames, Winter and Summer" (46). Mr. A. Donald (47—50, 115) has some fine landscapes, but which have nearly all of them the fault of being too dark; this is the more to be regretted since they contain some charming effects in sunlit wood and clear pebbly stream.

Mr. Arnold J. Spiller shows a collection of little holiday sketches, which include "Canonbury Tower," perhaps the best of the series.

The School of Military Engineering, Chatham, exhibit half-a-dozen fine landscapes; "Burnham Beeches" (56), with its sunlight effect, and the Clevden Woods on the Thames, being the best of the series. Mr. G. A. Ferneley (59, 67, 166) shows three series of pleasing landscapes, and Mr F. Downer exhibits good work in 130, "Waiting for the Bride," although the group in question has something of a set appearance. Of Mr. Best's pictures we prefer "Cottage near Hendon" (162), which is a very clear and tasteful photograph. In the frame of views (61) it would seem that Windsor Castle and Richmond Bridge, by some fortuitous circumstance, were under one and the same cloud when photographed, for the outline of it is precisely similar in both pictures.

Mr. Charles Bennett's (63, 153) effective pictures of Sussex churches are worthy of note. Mr. Adcock's interiors are particularly good (144a), though it is a pity there should be such serious intent on the part of all the occupants of the "moruing room" in reading and writing. They are so hard at it, one can hardly help thinking they must be only making believe; but the lighting is managed with consummate skill, and the rooms are well illuminated without any flooding. A study of ferns (73) is one of the best of Mr. J. M. Brown's collection, some of which would be improved by a clipping of the foreground. Mr. R. Keene's work is always good; and the bright little Derbyshire views (70) he exhibits this year will add to his reputation.

Mr. F. Piercy has a large series of his Piercytpyes, (71, &c), printed by Plantinotype. Similar in appearence to fine chalk sketches, they are produced from softly-printed photographs, which are afterwards treated artistically by a process of Mr. Piercy's own. Mr. H. Manfield contributes much good work; his rendering of statuary is beyond praise, as witness "Chantry's Sleeping Children" from Lichfield Cathedral. There are delicacy and brightness here that amount to perfection. Mr. Manfield's interiors (Haddon Hall, &c.) are also deserving of high praise. Some tiny sketches of Derby streets, by Mr. C. E. Abney (86, 87, &c.) may be likened to fine woodcuts, they are so sharp and clear, and lead one to the belief that if he undertook larger work, Mr. Abney would be no less successful.

Mr. Faulkuer (95, 96, 104, &c.) puts forward an extensive series of studies from tiny models, who are eloquent in their master's praise. "Speak, for thy Servant Heareth," an infant Samuel, with an up-turned face of prayer, is a sweet conception. Mr. Faulkner, apparently, can do what he pleases with his Liliputian sitters; the little Miss in her mob cap and mittens smiles or pouts, coquets or frowns, and thereby makes the most charming of studies in Mr. Faulkner's hands. The red chalk tint, too, adopted for these fragile faces appears particularly well suited for such artistic work, which is without its peer in the exhibition. Mr. B. Mildmay (97) is represented by a single study, "Alfred," the portrait in platinotype of a boy with a singularly bright and good-tempered face. Mr. Albert Clout shows a series of North Wales views (106), of which the Fairy Glen and the Lledr Valley are exceedingly good; the bowery foilage over the stream, the big boulders, the feathered cascade, and limpid water are all handled with skill and delicacy.

Mr. Dixon has succeeded as well with his tiger pictures as he did with the lions last year (129, 158). Note the lithe strong form of the standing animal—how well it carries itself, and what a picture of well-balanced power and latent strength it represents! In one of the enlargements there is the defect of a short-focus lens visible, but the employment of such an instrument is indispensable, we suppose, by reason of the barred cages.

Notes.

The privilege of taking photographs within the Melbourne Exhibition is purchasable by licences of twenty-five pounds each.

A photographer cannot originate, we are told. Very good, so be it. Only we should like to know how it comes then that Rejlander's "Ginx's Baby" is made the text of so many pictures? Although the baby is eight or nine years old now, it still appears in public, under various guises; its latest appearance was in *Figaro* last week. It has served as a caricature of Beaconsfield, as a frontispiece for music, as a Berlin-wool pattern, and as a comic cartoon. We have seen the picture burnt upon china—in the Belgian Court of the French International Exhibition—and in Paris this year we noticed on the Boulevards an attempt to reproduce it upon a large scale.

"Ginx's Baby," by the way, was not Rejlander's original title. He called the picture "Mental Distress" when he sent it to the Pall Mall Exhibition; but it got catalogued as "Ginx's Baby," and by that title it was known for ever after, albeit the artist strove hard to change it.

A correspondent desires us to ask, not as a conundrum, of course, but seriously, why the Hanging Committee of the Exhibition have placed small pictures on the wall, and have hung the screens with large ones. Strange to say, this is the only complaint that has been addressed to us this year concerning that aggravating and never-enough-to-be-execrated body, the hangers; next year, possibly, they may become entitled, each of them, to a pair of gloves.

We hope that Mr. Whaite's drawing-room pictures may have some influence with portraitists. It is some time since photographers discarded the broken column, usually set up upon a carpeted floor, and the sharply painted window giving on a curly wave. But even now pictures are frequently met with that have violent backgrounds, and speak loudly of the glass studio in which they were taken.

Referring to the rumour that M. Rousselon, after plucking a harvest of golden fruit, had retired from the active superintendence of the photo-engraving establishment of MM. Goupil et Cie, our Paris Correspondent writes that M. Rousselon is still at the head of this magnificent undertaking, and has no intention yet awhile of abandoning his position. We are glad to find that there is, at any rate, nothing in the first part of the rumour to warrant contradiction.

In copying negatives and producing transparencies in the camera, the employment of a sheet of ground glass in front of the original is very useful. Look at the image on the focussing screen, and note the difference in its brightness when the ground glass is placed before the head of the camera, and when it is withdrawn. Instead of the semi-transparent sheet cutting off light, as one might expect, it diffuses the latter, and brightens the image considerably.

Miss Thackeray's caustic criticism on conventional poses and conventional accessories was written some years ago, but it may well be borne in mind. "If dignity is desired, the plaster column is brought into requisition; if repose is considered more characteristic, the dining room chair and the small rickety table are produced. You are requested to place one elbow on the table, to turn your head back over one shoulder, to point out your little finger if you are a lady, to put one hand into your pocket if you are a man. Art can go no further. With the tasteful addition of a vase, or a small bronze statuette of a horse, and a volume negligently placed upon the small table, the composition is complete."

We do not think Miss Thackeray would write in this strain after a visit to the present Pall Mall Exhibition; she would find it hard to point to a single example illustrating the poses so flippantly described, and possibly would feel a little surprised that she should ever have treated photography so cavalierly. Still, no one will deny that the old carte-de-visite, against which the attack is directed, left much to be desired.

"Paint me as I am, warts, wrinkles, and all," is said to have been Oliver Cromwell's injunction to the portrait-painter, and the stern command is sometimes quoted in condemnation of retouching. We should be the last to commend the entire suppression of "warts, wrinkles, and all," in a portrait, but we have always thought that the great Republican, if he ever did say such a thing, was quite as vain as any golden-haired damsel who desires to appear freckleless in her portrait. The cavaliers and their ladies in Cromwell's time were so addicted to the practice of adorning themselves with wigs, powder, patches, ruffles, lace, buckles, and fallals of all sorts, that the old Roundhead took a positive pride in appearing as ill-favoured as he could, and no doubt desired to be handed down to posterity the very contrast of his "Frenchified" rivals.

And now, having cast our shaft at Cromwell—it won't hurt his tough old character much—we should like to say a word on behalf of the much maligned golden-haired damsel. It is the unfair way in which the freckles are rendered by photography, and not the freckles themselves, she objects to. If the print shows a white face covered with black spots, she may surely hesitate to accept it as a portrait. The highly retouched, enamelled, and embossed picture may be false to nature, but it is not, at any rate, the libel which the untouched negative of a blonde frequently represents.

So much for freckles. As to wrinkles, every photographer knows how much these may be lessened or magnified by his mode of lighting. In many cases, sitters are in the right when they grumble about the sunken eyes and deep crowsfeet in their pictures. The eye-cups are made into dark caverns, and furrows magnified into ditches. The more skilled the lighting, the less necessity there is for retouching.

Topics of the Day.

A BROWN PAPER SITTING-ROOM.

BY C. D. DAVIES.

As the amateur portrait photographer is rarely at a loss for volunteer models from amongst his friends, the subject of providing a temporary and inexpensive studio for the accommodation of his sitters, where the amount of light may also be in some degree regulated, will, perhaps, be of interest and service to beginners, who may have neither the money nor the space for the erection of a proper glass-room; and, therefore, with your permission, Mr. Editor, I will attempt a description of the edifice in which I have fairly succeeded in the somewhat difficult task of obtaining out-of-door portraits, that have given satisfaction to the originals, judging from the orders for copies that have frequently followed the inspection of the first proofs.

My garden is small—100 feet long by 24 feet wide—and runs east and west; against the wall facing north, I inserted in the ground, at a distance of eight feet apart, two wooden sockets, similar in shape to those used for holding clothes-line posts. At eight feet from each of these are similar sockets at right angles to the wall, and marking the four sides of a square, each eight feet in length.

I then procured four stout deal posts, 3in. broad and $2\frac{1}{2}$in. deep, with the ends shaped to fit in the sockets, leaving eight feet out of the ground, and screwed a strip of deal, eight feet long (one inch square) on each of the edges of the posts to be nearest the wall, on the side

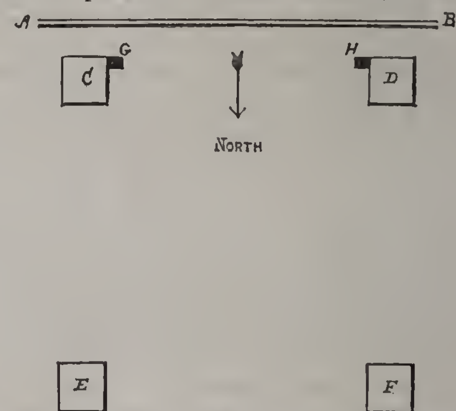

Fig. 1.

A B, north wall. C D E F, the four posts, the black portions, G H, representing the strips of deal. These strips are to form supports for the back frame-work, to be afterwards described.

facing east and west. Into the top of each of the posts I let in, sufficiently deeply to give it a firm hold, a piece of stout iron wire, about as thick as the iron part of a large brass-headed picture nail, leaving a portion projecting from the wood-work of about $1\frac{1}{4}$in. I then joined the front and back posts by two pieces of flat wood (fig. 2), cutting dove-

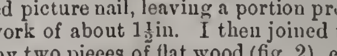

Fig. 2.

tail slots in the tops of the posts for A and B to fit into (fig. 3). A framework of 3in. by 1in. wood, folding in the middle, with a hole in each corner for the iron wire at the top of each post to pass through, was then put together; the cross-pieces, A and B, forming supports for it—the whole making a rigid skeleton for the sitting-room.

The next operation is to make a roof frame from the same sized wood, eight feet by four feet, strengthened with two cross-pieces, and to nail on it a piece of floor-cloth or

kamptulicon; this is then attached to the top piece by two

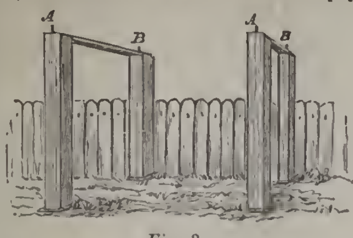

Fig. 3.

sliding hinges, the hooks of which I have shown in the sketch of the frame (fig. 4). The roof is kept at the required

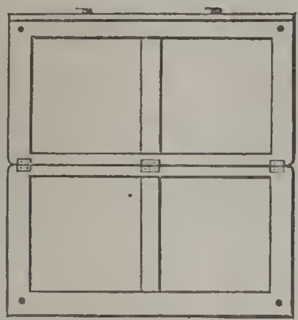

Fig. 4.

slope by two movable iron arms, perforated with a series of holes for the reception of two projecting iron arms let into the sides of the frame of the roof.

All that now remains to be done is to make three folding

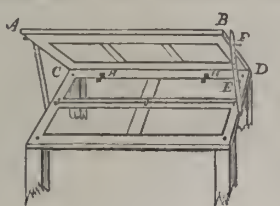

Fig. 5.

A, B, C, D, movable roof covered with oil-cloth, attached to frame by slipping hinges; E E, iron arms; F, iron pin to be inserted through holes in arms to keep roof at the proper slant.

frames (fig. 5), with cross-pieces to keep them rigid, to fit into the back and two sides of the sitting room. The back frame must be made to fit accurately between the posts, and will be kept in position by the two strips nailed on to the posts; a stop of the same sized wood nailed on the underneath part of the top piece, and two buttons, H, H, to prevent it falling forward.

The side pieces are kept in position by a catch (fig. 6)

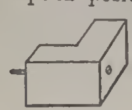

Fig. 6.

screwed on the side of each of the front posts, and a strip of inch deal fastened on the back folding framework, sufficiently far from each edge to admit the thickness of the side-frames. All three frames should be covered with strong unbleached calico, over which should be evenly pasted large sheets of brown paper, which makes a capital plain background. I use, however, a plain distemper background made to roll up by a pulley and cord into a long box when wanted; this is fastened to the back screen by means of two brass eyes fitting into metal slots projecting from the top cross bar. Should more light be required at either side of the sitter, one or both the side-screens may be folded back.

The description probably seems complicated, but with the aid of a pair of steps the whole can be put together in a quarter-of-an-hour, and packed up in the same time. I

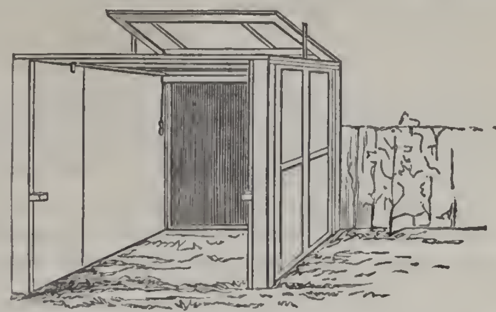

Fig. 7.

leave my frame-work (which is painted) out during the summer, only taking down the three screens and background, which I stow away in a convenient passage.

With the aid of a few simple accessories, such as pieces of slag, some plants, a chair, table, and an umbrella, &c., &c., excellent results may be obtained, some of which I forward you.

I have obtained several picturesque effects by gumming a piece of damp tracing-paper on the reverse side of the negative, and painting on it, when dry, with Indian ink—clouds, sea, ships, or whatever the subject may require.

Of course the wet process has given way to gelatine. My negatives are developed by the iron and neutral oxalate formula supplied with Nelson's plates—*minus* the sugar. My favourite lens is a rapid rectilinear, which I carefully shade with a telescopic box, blackened inside, and fastened to the camera. I have a flap shutter, resembling a sky-shade, inside my camera, held up when focussing by a nut and screw, and it is certainly a great advantage when the portraits of children are attempted, as the action of taking off the cap generally disturbs their attention. When intensification is necessary, I place the negative in a dish of bichloride of mercury solution (water, 10 ounces; bichloride, 4 drachms) till white. Wash well, then immerse in ammonia solution—strength: water, 10 ounces; ammonia, 4 drachms.

After fixing the prints I wash them in several changes of *warm* water in a glazed earthenware pan, and then leave them to soak all night in a large bath full of water; I never find them change colour, nor fade.

When away from home I have found that a night-light, covered by a pyramid glass shade, and coated with Thomas's ruby varnish, answers capitally to develop by. At my own house I use a paraffin lamp enclosed in a wooden frame-work cased inside with tin, having a double top of tin, the ventilation being that described in last year's Year-Book. The back of the frame-work is of tin, and into the front and two sides I slip, by means of grooves, three sheets of glass, coated on both sides with Thomas's ruby medium. I have had this lamp in use for nearly twelve months, and find that the varnish adheres as firmly to the glass as when first it was put on.

The "Topic" for next week will be "Experiences in the Development of Gelatine Plates," by W. T. Wilkinson.

Correspondence.

FARMYARD PICTURES.

Sir,—Perhaps some of your readers may be able to give me some information upon the following.

A short time since, having been informed by my employer that I might have a fortnight's holiday, and being an amateur photographer, and desirous of emulating Mr.

Payne Jennings and Mr. Jabez Hughes, I started for Sussex, armed with my camera and box of dry plates. I was fairly successful, and, having fine weather, managed to secure some very good pictures.

At a village called Barcome, I dropped across a view that I thought would make a "gem" of a picture, and will here describe it and the difficulties which beset me. The scene was a farmyard adjoining a water mill, with a rustic bridge close by, and a goodly scattering of ducks and geese on the water; also various kinds of poultry on the farm, and, as if to lend an additional charm to the whole, a man was unloading a cartload of hay.

Having bribed the man (with a glass of ale) to remain steady when necessary, I put down my traps, and proceeded to fix the camera, the winged creatures eyeing me very suspiciously—one sage and learned-looking goose more particularly, who, when he saw me put my head under the focussing cloth, set up a loud cackle, which was immediately taken up by (I suppose) his "sisters and cousins," and they, with all possible speed, made for the house, evidently in great alarm, supposing that their last hour had come. Having obtained some corn from the farmhouse, I tried to entice these simple creatures to the water, and here I was rewarded with success; but no sooner had I reached the camera, and put my head under the cloth to focus, than off they started again, and all attempts to induce them to return were futile.

Now as my picture would have been of little use to me without the "pretty creatures," and, worse still, with them running about, I gave up the idea of a picture. Can any of your readers inform me what means I should use to persuade these "silly creatures" to stand the cold glassy eye of the camera?—I remain, yours respectfully,

A Young Duck.

ABSORPTION AND RADIATION OF LIGHT IN PHOTOGRAPHY.

Sir,—I send you the following fact as bearing upon the article in the last number of the Photographic News, and relating to the absorption and radiation of light in photography.

Some twenty-five years ago I was taking some calotype negatives of winter scenery—the subject a landscape covered with snow. One of these negatives was much over-exposed, and a faint outline of the picture was present when removed from the camera. This over-exposed picture was left in the developing solution, in contact with a second negative, the two sensitized surfaces opposed to each other. Being unavoidably called away for a short time, upon my return I found the over-exposed picture had impressed strongly its exact duplicate upon the second negative, which in turn had also reproduced itself upon the over-exposed picture. The latter was a feeble image, the exposure in camera being short.

I shall be glad to learn if other of your correspondents have met with similar results.—Yours truly, W. Bunn.

THE EXHIBITION.

Dear Sir,—May I ask you to call attention in your next to the blunder in the *Times'* notice of the Exhibition of the Photographic Society of Great Britain? The series of pictures for which I have the honour of being awarded a medal, are described as the work of Mr. Vernon Heath.—I remain, dear sir, yours very truly,

W. Harvey Barton.

DEVELOPMENT OF GELATINE PLATES, ETC.

Dear Sir,—I have tried the plan proposed by Mr. Morgan of developing plates by daylight: I cannot see any advantage gained, as after the plate is covered by the oxalate developer, any amount of red light can be admitted, and allow the development to be watched. I am sure there is a want of vigour and brilliancy in negatives exposed to daylight during the development. I always follow the plan of Captain Abney, carrying my plates in a basket when travelling. I also carry in a large fishing-basket, a $7\frac{1}{4}$ by 5 camera, double and single-slide lens and tripod, and in a hand-bag as many dark slides as possible. With this weight I can do a good day's tramp. When on a tour, I always take a tent with me in preference to risking the chance of getting a room suitable to change my plates in.

I have been a good deal in Lower Brittany this summer, but never met with a single specimen of the British photographer. It is a glorious field for the amateur. Old churches, chataux, environs, curious old streets, and river scenery, accompanied with cheap living and good cooking.—Yours truly, R. Gordon.

[Major Gordon will be glad to see Mr. Gale's pictures of Normandy and Brittany, in the Exhibition.—Ed. P.N.]

PHOTOGRAPHERS AND ILLUSTRATED PAPERS.

Sir,—Our attention has been called to an article which appeared in your issue of the 1st inst. on "Photography In and Out of the Studio," in which you observe: "How many of the portraits of the New House of Commons, which appeared in the *Illustrated London News*, were copied from photographs, and the originals never even seen, and in how many was the assistance afforded by the photographer recognized? In painfully few instances, we fancy, was the latter the case. This, surely, is not fair!"

We are sure that you would not knowingly be guilty of an injustice to an eminent and honorably-conducted journal, and we therefore write to say that as a large number of the portraits of the House of Commons referred to have been produced by us, the *Illustrated London News* invariably acknowledged the source from whence their engravings were derived.

The acknowledgment is made under the biographies of the members. The writer of the article, not seeing the acknowledgment under the portraits, has probably concluded that no notice had been taken of their source. We may also mention that a registered copyright photograph cannot be copied in any journal without permission, under serious penalties.—We are, sir, yours faithfully,

G. W. F. Cox.

pro London Stereoscopic and Photographic Company.

BRISTOL INTERNATIONAL EXHIBITION.

Dear Sir,—Will you allow me to say that in addition to the general Exhibition, there will be a purely "Loan Department" not in competition, and the Association will be exceedingly obliged for any interesting old or modern photographs or appliances, also any well-known photographs of recent celebrity which are not entered for competition.—Yours truly,

Harry A. H. Daniel, Hon. Sec.

PS.—I would just state that applications for space are rapidly arriving, and although the time does not expire till Nov. 1 (for preliminary applications), the sooner I can receive them the better I shall be pleased.

[We regret that want of space compels the postponement of some of our correspondence this week.—Ed. P.N.]

Proceedings of Societies.

South London Photographic Society.

The members of this Society met for their first meeting after the summer recess on Thursday, Oct. 7th, in the room of the Society of Arts, Adelphi, Mr. P. Mawdsley, V.P., in the chair.

The minutes of the last meeting having been read and confirmed, Messrs. W. J. Chivers and Charles Jones were duly elected members.

The Secretary then read a letter from the President, stating

his inability to attend through ill-health, and also stating, as the subject for monthly competition, "Autumn Fruits."

The Chairman said he was sure all the members would be grieved to hear of the ill-health of the President, and, on the part of the members, would ask Mr. R. Statham, who was present, to convey to his father the feelings of the members present.

The Chairman then stated that the adjourned discussion on "Lanterns" would be resumed.

Mr. Cutchey, in a few words, again advocated the use of the blow-through jet, in preference to the mixed jet, for safety; he would also advocate lecturers to give plenty of pictures, and a very few words.

Mr. Bridge said he differed from Mr. Cutchey; a wordy lecturer certainly was not a benefit, but he had found that sometimes the pictures were passed too rapidly through the lantern, and, just when the audience were beginning to appreciate the picture, it was withdrawn. The blow-through jet, he thought, was of no use, as an image could not be thrown a long distance with it, and, in the case of large halls, this was necessary, and, with proper back pressure valves, the mixed jet was as safe as the other, if anything like care was taken.

Mr. York then referred to the way in which accidents may happen, through gross carelessness, even with the blow-through jet, as, for instance, one case he knew of, a person sitting upon the gas-bag, instead of using weight, and, getting up when the bag was nearly empty, a sudden suction of air ensued, and then an explosion; another case he could mention was by turning on the jet in the lantern before being able to apply the lighted match, the consequence being the shattering of the lantern.

Mr. Bolas said there was a great difference in blow-through jets, but by a little alteration they could be made very good.

A conversation ensued, relative to the merits of the different jets, Messrs. Ackland, Pearsall, and others expressing their opinions.

Mr. W. C. Hughes then showed his Triplexicon, it being two lanterns for burning mineral oil, the advantage being a special construction of chimney to the lower lantern, by which means the upper one was kept perfectly cool; he also showed an ingenious screen stand, by means of which all the trouble attendant on putting up a proper screen was avoided, the frame being jointed together, so that in a few minutes it could be easily put together.

After votes of thanks had been passed to those gentlemen who had taken part in the discussion,

The Chairman passed round several photographs of photographic celebrities, they having been sent to the Society by Professor Stebbing (an honorary member of the Society) from Paris.

The Chairman then called the attention of the members to the fact of the presence among them of Major Waterhouse, a gentleman who had done so much to advance the photographic art.

Major Waterhouse having briefly thanked the members for the kind reception given him,

Mr. E. Dunmore read a paper—"How to Cure Certain Defects in Gelatine Films" (see page 496).

Mr. A. L. Henderson thought dust the great producer of pitting in gelatine plates. With regard to the addition of acetic acid, he should think plates made from such an emulsion would not keep.

Mr. Dunmore said he had never found the acetic acid to have any deleterious effect upon the plates.

Mr. Nesbit said he always found Coignet's gelatine gave pits.

Mr. Cobb agreed with Mr. Henderson with regard to the dust, and said he also found Coignet's gelatine seemed more susceptible to dust than any other.

Mr. W. Brooks said he had been successful with Coignet's gelatine, and he thought the best way to cure pits was to let the emulsion cool for twenty-four hours; if left for two or three days it cured the pits, but frilling then set in.

Major Waterhouse said he had been very little troubled with pitting, except from dust, in making carbon tissue. He had found them in making collotype plates, but could ascribe them either to dust or decomposition.

Mr. E. Foxlee had found pitting both in making collotype plates and carbon tissue; he ascribed them to grease in the gelatine. He did not consider the strength of the gelatine had much to do with it. The makers of the thin-coloured gelatine for fancy boxes were troubled very much with pitting, and they used ox-gall to cure it.

The Chairman, in closing the discussion, said that Coignet's gelatine had many advantages, but the disadvantages militated very much against its use. He then announced that the annual Technical Exhibition would be held at the next meeting, November 4th, and that the annual Dinner of the Society would take place on the Saturday following the Technical Meeting, viz., November 6th.

The meeting then adjourned.

Edinburgh Photographic Society.

The ninth ordinary meeting of this Society was held in 5, St. Andrew's Square, on Wednesday evening, the 5th October, 1880. In the absence of the President, Mr. J. G. Tunny occupied the chair.

Minutes of past meetings having been approved, the following gentlemen were unanimously elected ordinary members:—Messrs. R. J. Linton, George Murray, and James Paton, of Edinburgh; Messrs. George F. Paterson and George Bennett, of Portobello; and Mr. James Walker, of Aberdour.

Mr. Alexander S. Mackay next read a dialogue entitled "Odds and Ends upon Art" (see page 496).

Mr. W. Neilson, in proposing a vote of thanks to Mr. Mackay, said that such papers indicated that the photographic world was not confined to the mechanical. The works of a man were a certain indication of his mental calibre. An artist in producing a drawing only reproduces his own notions of things. As is the fountain, so is the stream from it. An artist or photographer of high culture produced works superior to one less gifted; it therefore was most desirable that the æsthetic faculties be cultivated from the earliest years: the child should imbibe unconsciously a refined taste from the surroundings of the nursery; and thus an admirable foundation would be laid for high mental culture in succeeding years.

Mr. Marshall Wane recollected the attempt of a scene-painter, named Philips, to introduced backgrounds in colours, but for photographic purposes they were total failures.

Mr. J. G. Tunny said the present capabilities of art and photography were immense, and cultivation would increase their power. It was always pleasant to a sensible photographer when he found his work intelligently and generously criticised, and he was always on the alert to avail himself of every means of improvment. Exhibitions of work of art were of high educational value, and, referring to the annual exhibition of the Royal Scottish Academy, he said that while some pictures were worthy examples to follow, many others would be found teaching only what should be avoided.

Mr. M. G. Dobbie highly complimented Mr. Mackay on the way he had treated his subject, and regretted that through the many other meetings being held in the town that evening the attendance was so limited.

The usual votes of thanks terminated the proceedings.

Sheffield Photographic Society.

The Annual Meeting of this Society was held on Tuesday evening, October 5, at the Freemasons' Hall, Surrey Street, where a substantial tea was provided for the members, Councillor Thos. Firth presiding. The accounts of the last year were read over and approved. There being a balance in favour of the Society, it was decided to present each member of the Society with a picture from a selection of excellent views by Mr. Abel Lewis, of Douglas, Isle of Man. The election of officers for the ensuing year then took place:—

President—Dr. Morton, of Brightside.

Vice-Presidents—Messrs. H. P. Collinson and Walter Dakin.

Treasurer—Mr. J. Stringfellow.

Honorary Secretary—Mr. J. Taylor.

Members of Council—Mr. J. Frith and Mr. J. D. Leader, together with the officers.

Votes of thanks were cordially given to the past officers.

The President (Thomas H. Morton, M.D.) gave a short address. In the course of his remarks he said, that the more he became acquainted with photography, the more he was impressed with the conviction that proficiency could only be obtained by hard work and steady application; and if the branches which really belonged to photography—viz., chemistry, optics, and physics—were studied, the subject was worthy of the strongest and noblest intellect. Many of the difficulties in acquiring a knowledge of this beautiful art had been removed by the early pioneers (great praise was due to them) and more recent ardent investigators, who, in spite of frequent failures, had continued their experiments, and brought

photography to its present high state of perfection. But much remained to be done, and it was to societies like this we must look for help. The contributions of members to the journals were most frequently valuable, and should be carefully read. There was, however, a desideratum. Photography was not systematically taught as it ought to be, and he hoped if ever a scheme of technical education was brought forward, a school would be found for it. In the meantime, he suggested there might be in the large centres—Manchester, Liverpool, Glasgow, &c.—gentlemen appointed who would give a course of theoretical and experimental lectures, which members and those interested could attend, and certainly would assist the young beginner, who is generally at first enthusiastic, but meeting with sundry streaks, spots, comets, and other objectionable phenomena in his bath, became disheartened, and ultimately gave up the subject in despair.

Several suggestions were made by members for advancing the Society; *inter alia*, it was proposed to have a lantern exhibition of members' production, and as the past year has been rather successful in out-door work, a good result is expected.

A vote of thanks was accorded to the Chairman, and the meeting shortly after broke up.

Photographic Society of Ireland.

The first meeting of this Society after the summer recess was held in the Royal College of Science on Friday, the 8th instant, Mr. Thomas Arthur Bewley in the chair.

The minutes of the previous meeting having been read and confirmed, four new members were proposed for election, and will be balloted for at the annual meeting.

The majority of the members present at the recent out-door excursion of the Society exhibited the pictures taken on that occasion, some of which were much admired.

Mr. Joseph Woodworth exhibited a positive taken on a tannin plate, which he had prepared twelve and a-half years ago, but which showed no signs of deterioration.

A discussion then took place on the expansion of the films of gelatine plates during development, during which it was mentioned by Professor Hartley that on one occasion he had obtained in that manner a 10 by 8 negative from a 7 by 4 plate.

Mr. Thomas Mayne exhibited a series of views lately taken by him during a trip to Oberammergau.

The meeting then adjourned to Friday, the 12th November, when the election of officers for the following year is to take place.

Photographers' Benevolent Association.

This Association held its monthly meeting at 181, Aldersgate Street, on the 6th inst.

The minutes of the previous meeting were read and confirmed.

A letter from the Photographic Society of Great Britain was then placed before the meeting, in which it was stated that the Council placed their Exhibition at 5a, Pall Mall, at the disposal of the Photographic Benevolent Association for one evening in aid of the funds. The Board of Management decided upon Thursday, the 11th November, when the Exhibition will be open from seven to ten o'clock p.m., the charge for admission being sixpence. The Board earnestly solicit the co-operation of members and others in disposing of tickets, which can be obtained from the Secretary, thereby assisting the Association in carrying out its benevolent purposes.

A vote of thanks to the Council of the Photographic Society of Great Britain was proposed, seconded, and carried unanimously.

The meeting, after disposing of some minor business, adjourned.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

Ebor.—They may either arise from particles in the collodion, or from an excess of iodide in the bath. If from the first cause, either filter or decant your collodion; if from the latter, either add nitrate of baryta in the proportion of four grains to each ounce of bath solution, or dilute the bath by adding an equal volume of distilled water. This last method will cause the iodide to precipitate; filter your bath, and then add nitrate of silver enough to make it up to proper strength.

Little Nemo.—Here is the Author's reply:—"As you surmise, by the line of horizon is meant that part where the skylight ends ahead of the sitter—the distant edge of the glass roof. Subduing the minor lights is equivalent to increasing the major lights, and the former is necessary because the later operation is impracticable. A full front light gives flatness, but as it continues to be excluded, the objects illuminated are brought more into prominence if the more immediate lights are allowed to continue in their normal intensity." If the writer of the paper in question expounds a theory unusual, it is best for you to test it against the recognised system, and accept which seems preferable to yourself.

Leo.—The defect is a common one, and arises from imperfectly polished glass.

Wanted, a Word.—Mr. H. E. Palmer writes:—"'P. C.' would have made a bravo general, for he is not easily made to see his defeat. He says: 'Sir Joshua, in speaking of the picture of St. Sebastian, was not speaking of the Saint *himself*,' and contends that had he so sat he would have been the '*subject*,' not the model; but, sir, directly after he is half converted, for he adds, that the man who personated the saint *was* 'the model from which the imaginary portrait was copied;' or perhaps 'P. C.' means that only duplicates are *models*. If he means that, sir, what shall we call original negatives, for only their duplicates would be entitled to that honor? If those who paint call sitters models, why is it not good enough for photographers? I insist that nature in all her phases offers innumerable models from which pictures are produced; the titles of the subjects depend a great deal on the taste and humour of the artist. Sir Edwin Landseer, for instance, was especially happy in the choice of his subjects. One of his latest productions was entitled 'A Pair of Nutcrackers and a Piper.' Here is a case in point Who, on reading the title of the subject, would expect to find that the illustrious artist had employed for his models Two Squirrels and a Bullfinch! Mr. F. A. Bridge, who writes that he is quite unconcerned about the fate of either 'P. C.'s' suggestion or my own, and presents his own little baby (at first sight I thought it was *Ginx's*, it is such an '*object*'!) says: 'Possibly'—mark the word, sir! 'possibly' (not probably, though) '*object*' would in *many* cases be more correct than either. I am glad Mr. B. qualifies his idea, for if it was applied *universally*, 'P. C.' and himself between them would convert all Her Majesty's 'subjects' into '*objects*.'"

W. B. A.—Proceed in the same way as laid down for Collodion Transfer Enlargements in News of July 16th, only employ opal instead of plain glass, and do not strip. See also Year-Book 1879, page 111, from which you will see method of arranging camera &c.

Geo. Chapman.—1. No, we certainly cannot. Are you quite sure your oxalate developer is properly mixed? Employ the simple formula of Dr. Eder. 2. Plates of a later make you will find fix more quickly; the film is so hard and tough that the solution has difficulty in penetrating. 3. No. 4. We scarcely understand this question; Nelson's developer is one of the best we know of. Very sensitive plates will develop both with a strong and weak developer, only it is always wise to keep development under control, and this you cannot do if the image flashes out immediately. As commercial plates vary in sensitiveness, it is sometimes necessary to change one's developer; but if you once get accustomed to one formula you will rarely have difficulty in controlling your plate.

R. R.—Thank you for the "Note"; you see we have used it with a slight modification.

F. Daking.—The fault is inherent to the glaze. A slight sizing would at once prevent the ink from running, but the application of this would probably injure the glaze; you might, however, try. But under any circumstances we cannot recommend mounting pictures on cards that attract moisture; damp does more harm to silver pictures than even sulphur compounds.

Poor Printer.—1. Scott Archer. 2. Niepce de St. Victor. 3. At the British Museum.

Original Research.—See England's mode of preparation and formula in "At Home" of April 9th. White of egg is the best form of albumen you can use; if it only contains 12 per cent. of pure albumen, you must remember that the rest is only water. Manufacturers employ it after simple whisking. We shall have something to say on the subject shortly.

A. D. Lens.—Try Mr. Werge, of Berners Street.

D. A. K.—You must have an equatorial telescope, one that moves with the earth. This is absolutely necessary; then you can give any exposure you desire—two or three hours if necessary. Any of the well known commercial plates would be quite sensitive enough. You must have made a mistake in your experiment; Janssen gets an image of the sun with an exposure of 1-2000th of a second.

A Victim.—We will make it our duty to write to your correspondent; you shall have a letter from us later.

Henri E. Hudson.—We will enquire for you.

A. B. C.—It is neither injurious nor explosive, but the fumes are very dense, and require therefore to be carried off. Any photographic dealer will supply you.

The Photographic News, October 22, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

The Rapidity of Gelatine Plates—New Developers—Photographic Exhibitions—Reversed Negatives.

The Rapidity of Gelatine Plates.—Our valued colleague Captain Abney, to whom we are much indebted for an interesting article, full of practical hints, "Lessons learnt during a month's tour abroad with gelatine plates," makes a statement about the rapidity of his own dry plates; he mentions two classes of plates made by himself, "very rapid, and comparatively slow. The former were about fifteen to twenty times more rapid than wet plates, and the latter about four times only." As is known, manufacturers of dry plates go still further in the estimation of the sensitiveness of their plates, as plates of twenty times the sensitiveness of wet plates are often found announced in advertisements. Is this twenty-fold sensitiveness really present? Portrait photographers deny the statement; they declare, that if they want to take a properly exposed portrait, full of details in the shadows, with these particular plates, they need at least an exposure of about quarter of the time necessary for wet plates. With portraits the direct sunlight is excluded, and the reflected light is very much darkened and coloured. The relations are totally different to those with landscapes. With landscapes one-twentieth of the exposure which is necessary for a wet plate is sufficient, if the sky is clear, the sun shines, and no dark objects are in the foreground. Captain Abney gives an interesting example of this: "Snow peaks seen in the distance, foreground of fir tees. No. 2 landscape with angle lens, No. 3 X stop, rapid plate, two seconds' exposure, *mountains rather overdone, foreground rather undertimed.*" We have obtained in twenty seconds with the same lens and the same stop under similar circumstances, with a wet plate, a picture, in which the foreground was by no means undertimed. Rapid plates are scarcely more than ten times as sensitive as a wet plate; those which we have ourselves prepared according to the excellent formula of Captain Abney appeared to be even less sensitive, although they bear comparison with the best plates in the market. Of course we do not venture to draw conclusions from this fact as to the sensitiveness of the plates which the excellent investigator has prepared himself. Here only very accurate experiments, in which wet and dry plates are exposed side by side under circumstances precisely the same, can give information, and different subjects, portraits and landscapes, must be treated in these experiments under different relations of light. We lately made a negative by means of a gelatine plate of a white marble bust, in an open studio, with one-fifteenth of the exposure of a wet plate, and obtained a very beautiful result; when taking a portrait on a similar plate in diffused light, however, we found a quarter of the time of exposure of a wet plate necessary. We believe, accordingly, that assertions respecting the sensitiveness of the gelatine plate have been commonly made too favourable, and this is to be regretted, since less experienced amateurs and photographers are easily occasioned thereby to use too short times of exposure for gelatine plates. Even experienced practitioners may go wrong through it. We prepared this summer a number of gelatine plates with emulsion made by ourselves, and determined the sensitiveness to be two-and-a-half to three times as much as that of a wet plate for portraiture. One of the best known English dry plate makers, to whom we gave our plates for examination, valued the sensitiveness, however, as sixfold. Who was right?

New Developers.—Dr. Eder, the unweary and industrious investigator in the province of photo-chemistry, has, in his latest publication, again made known to us some new developers, and confirmed the statement of Captain Abney, as to the striking properties of hydrochinone as a developer. Perhaps these investigations may lead soon to a new manner of developing for dry plates. Hydrochinone is, however, much too dear to be able to supplant pyrogallic acid; but, as soon as the want of hydrochinone becomes more common, ways and means to prepare it more cheaply will also be found. That reminds us that we paid—eleven years ago—three shillings for a dose of chloral hydrate, which now does not cost as much as sixpence.

Photographic Exhibitions.—We learn, from continental reports, that only 85 exhibitors sent to the International Exhibition in Ghent, held this summer in celebration of the Belgian Independence. Of these, 29 came from Belgium, 10 from England, 10 from France, 18 from Germany, 8 from Austria, and the rest of the European States sent 4. Numerous printing processes were arranged in view in the first line for heliography, phototypes, photo-relief and pigment printing, and ceramic photography; but only at the end of the long prize-list is found a prize of 100 francs, a medal and a diploma, granted for the most beautiful collection of photographs on albumenized paper. Under such circumstances, it is not surprising that portrait and landscape photographers, who predominate generally in all photographic exhibitions, did not feel much attracted by this. The less fortunate exhibitors of silver prints who were honoured with prizes are the following:—V. Angerer, Vienna, for reproductions of oil-paintings and interiors; Maier, Munich, for instantaneous pictures of Munich, on gelatine plates; Annan, Edinburg, for landscapes. The report confirms the idea that the interest for photographic exhibitions is weakened by international exhibitions following one another too quickly. It has, however, by no means weakened enterprise to undertake new international photographic exhibitions. We hear from Vienna that the Photographic Society there will arrange, next spring, for an international photographic exhibition in celebration of the twentieth year of its formation. The Exhibition will be opened in January. We think the time too early. In the dark days now coming on there is scarcely opportunity to prepare new pictures full of effect for the Exhibition, and, besides, three months from the decision till the opening of the undertaking is too short, especially as no programme is yet given out. We should advise the managers, in order to insure a numerous foreign participation, to adopt the method which the International Photographic Exhibition in Berlin has employed for the last twelve years. The latter nominated an agent for every country, who collected the objects for the Exhibition, and sent them together to Berlin at the expense of the commission of the Exhibition. Participation was thereby extraordinarily facilitated for the exhibitors, and there were, in fact, at each exhibition no less than three hundred exhibitors. We look forward with interest to the programme, and only express the wish that silver photographs may be put somewhat more in the foreground than was the case at the Belgian Exhibition.

Reversed Negatives.—Of the different methods of preparing reversed negatives, as they are necessary for collotype, photo-lithography, &c., may be summarised: (1) exposure with a mirror; (2) exposure with collodion film reversed in the dark slide; (3) removing the film from the glass with gelatine; (4) reproducing the negative by means of the dust process (Obernetter); only the third, it seems to us, is generally employed. Why? Is it the most convenient? We think not; pouring on gelatine solution, waiting for drying one or more days, and sometimes spoiling the valuable negative during removing, is scarcely an easy and desirable method. Compared with this, Obernetter's dust process appears simple. In a few minutes he covers a glass plate with gum and chromate, dries, exposes to the light a few minutes under a negative, and dusts then with graphite; he thus obtains a reversed negative in the space of ten minutes, and equal in delicacy to the original negative. We have seen the process carried out ourselves in Obernetter's laboratory in Munich, and have been astonished at the simplicity and beauty of the results. Obernetter never uses the original negative in his printing process.

At Home.

MR. ROBERT FAULKNER IN BAKER STREET.

This is the kingdom of Lilliput. From the walls look down upon you tiny forms and chubby faces; they smile or pout, are roguish or coy, bright or tearful, under the gentle sway of the silvery-bearded monarch who here reigns supreme. Like the pied piper of Hamelin, Mr. Faulkner can do as he pleases with his little people. It is not a question of obedience; it is an innate power he possesses, which renders them subservient to his will. We all of us have heard the German legend: how the pied piper was engaged by the village mayor to get rid of the rats, and having performed his task, got laughed at for his pains; how, in revenge, he went away playing upon his pipe so sweetly, that all the children, great and small, were perforce compelled to follow him; how he led them into a chasm in the mountain side, which closed upon the pigmy procession, so that the children were never seen again. Only one little fellow escaped—he was lame, and could not hobble along on his crutches so fast as the other children. He was shut out by the rock, and remained to tell the story. So, apparently, Mr. Faulkner has only to exercise his will to make his tiny subjects follow him. In his hands they are not only plastic as clay, but smiles and tears, humour and pathos, are called up in the little faces at his bidding. Let boys and girls be ever so stubborn, Mr. Faulkner has but to breathe his spell and they follow him. As Goethe has it:

"Und wären Knaben noch so trötzig,
Und wären Mädchen noch so stützig,
In meine Saiten grief ich ein,
Sie müssen alle hinter drein."

It is not easy to get beyond the reception room. The merry dimples and winsome faces are for ever luring you to stay. Here is a little miss, in mob cap and loose gown, with curly locks and pensive look, who seems to have strayed out of a picture by Sir Joshua Reynolds. Here is a tiny being, her eyes as black as sloes, who has put up her bare arms behind her round head, and beams wickedly across to you. Here, a fair-haired urchin in the guise of petty officer, looking every inch a sailor; and here again a study, of which Mr. Faulkner is justly proud, the "Infant Samuel," whose upturned face is full of pathos and devotion.

Passing on, we enter a spacious gallery, in which are larger examples of Mr. Faulkner's work. Mr. Faulkner believes that a carte or cabinet negative is sufficiently large for most purposes, and his bigger pictures are all taken from these. Mr. Faulkner has a high opinion of powder pictures, but, unfortunately, he says, there is no one to whom the retouching of them can be trusted. A clumsy or ill-judged touch of the brush upon a delicate cheek or softly-moulded dimple will ruin the picture, and he now prefers to print his enlargements by the carbon process, confining the work of the retouching brush to simple "mending." "There is not five shillings' worth of retouching work on any of these pictures," said Mr. Faulkner, pointing to a fine series of studies, of which many have been published with marked success. A transparency is produced in the first place, and it is upon this transparency that depends the value of the finished work. Mr. Faulkner can bear out the adage, "If you want a thing done well, do it yourself," since he is compelled to produce every one of his transparencies by his own hand. But he has the great consolation of knowing that he is successful. Of some of his studies printed in "red chalk" carbon, no less than 10,000 copies have been sold, for Mr. Faulkner appears just now to have the monopoly of producing sketches of this nature, which are highly prized and eagerly purchased by painters and sculptors, as well as by the general public.

Mr. Faulkner speaks highly of gelatine plates for making reproductions, the soft, subdued character of the image yielded by a gelatino-bromide film being specially applicable to such work. For all his studio work, gelatine plates are also employed, and Mr. Faulkner's establishment is one of the few in which the silver bath has been wholly and completely got rid of.

We will walk upstairs into the glass room, for our readers are doubtless eager to learn all they can of Mr. Faulkner's method of treating his infant sitters. Our host courteously affords every information. How does he arrest their attention, call up that glow of intelligence in their faces, and give that vivid animation to their features? we ask; is it a matter of toys, or conjuring, or story-telling? "A ball is the best of all toys," replies our host; "this cow that gives real milk, often provokes wonder;" it is a toy treated Abyssinian fashion, a steak being removed from one of the flanks in order to permit the introduction of the milk in the first place; "but one must rely a good deal upon one's sayings and doings."

The camera and stand must be described. The stand is of iron to give solidity, and upon it is placed, one above the other, two cameras of almost equal size. The ground glass of the upper camera can be seen without stooping, and hence the focussing is done with the greatest ease. A guard or screen, permanently fixed, throws the ground-glass into shadow, and there is no occasion, therefore, for a dark-cloth. The cameras are fixed together; hence one focussing arrangement does for both. The lower camera only, receives a dark slide, the upper one is employed simply for focussing and watching the sitter; in a word, the upper camera acts as a "finder." Under these circumstances, as may be understood, the operations go on with smoothness and ease. There is no dark cloth, no pushing on one side the focussing screen to admit the entrance of a dark slide. There is a sensitive plate always ready in the lower camera, and no sooner has the model taken its seat than the operation may begin. The slide holds a plate large enough for four or six portraits, and if one of these is successful, Mr. Faulkner holds himself a happy man.

A movable pedestal, eighteen inches from the ground, serves as a platform whereon to pose the model. The sitter may thus be presented to the camera under one aspect or the other, without being troubled to move at all, and the photographer standing behind the cameras watching his opportunity has every chance in his favour. Often the sitter, immediately it sits down, is at its best; while under ordinary circumstances, the model has to obey twice, namely, at the time of focussing and the time of exposure, and sometimes gets so fatigued over the former operation that it has lost all animation during the latter, Mr. Faulkner, by the assistance of his movable platform and double camera, is enabled quickly to seize any and every favourable opportunity that presents itself.

That Mr. Faulkner is an artist of a high order, and stamps his work with the imprint of his genius, is known to all who are familiar with his work, and obviously we cannot follow him very far, unless we too possess the same attributes. But we can all of us do our best, if we like, and a visit to Mr. Faulkner's establishment shows how much may be done in photography if one is gifted with taste and endowed with application. Mr. Faulkner's studio has little in it that is remarkable, but he employs, as we have seen, his means to the best of his ability. The lighting is of a very simple character. A skirting board rises five feet from the floor, and there is no top-light. The side where it is glazed is of large sheets of transparent glass; but this is used with the utmost moderation. Blinds are freely drawn near the camera, and in the vicinity of the sitter large squares of transparent paper may be made to cover the glass.

Mr. Faulkner has no other models than the little sitters who come to him in the course of business. The delightful studies in red chalk that he publishes in such large numbers are simply selections from his negatives. He pays, however, much attention to the dressing—or, rather, undressing—of his models. This little garment, we see, apparently of yellow silk, it is so soft and glossy, is but fashioned out of fine calico, the edges frayed, *not hemmed*, and dipped

roughly into a little Judson's dye to give colour. Dressed in this simple tunic, no wonder the pink arms and legs of the model appear to such advantage, and that the drapery is rendered with such harmony and detail. But Mr. Faulkner has a grievance: he is dissatisfied with the printing processes of to-day for small work. Carbon printing, he avows, is not at the present moment sufficiently advanced for the printing of cartes, although it answers so admirably for larger pictures. The only thing that can give us the full amount of delicacy and permanence, in Mr. Faulkner's opinion, is collodio-chloride paper. "I have an album downstairs, which I will show you, in which all the prints are fifteen years old; they are mounted on plate paper, and therefore should be the last to show traces of fading. But in that book there are only two pictures in which these traces cannot be recognised; the one is a Wothlytype, the other a collodio-chloride picture."

As to the delicacy furnished by albumen and collodio-chloride, there is no doubt as to the advantage being on the side of the latter. Before the prints go into the fixing bath, the albumenized paper prints will doubtless compare well enough with collodio-chloride, but the fixing bath removes fine gradations from the albumen surface; the collodio-chloride, on the other hand, is not attacked by the hyposulphite solution, and retains all the delicate gradations with which it has been impressed during the printing operation. But collodio-chloride paper cannot be purchased fresh and new in this country. "The Germans have makers of collodio-chloride paper in their midst; cannot we find a single manufacturer of photographic materials enterprising enough in this country to give us what we want?" asks Mr. Faulkner.

The "At Home" next week will be "At Sarony Square, Scarborough."

ODDS AND ENDS ON ART—A DIALOGUE.

BY ALEXANDER S. MACKAY.*

A.—To return to photography, as means of education, I think every photographer should endeavour to gather a small collection of the finished mezzotint engravings from the works of the best masters, such as Reynolds, Raeburn, Lawrence, Hoppner, Watson Gordon, and other leading men; they are always floating about in sale rooms and old book shops, and cost little in proportion to their artistic value; they have the readiness of being in the photographic tone; they would teach the mastery of pose, show the relative value of the gradations from the highest lights to the deepest shadows; they would, in fact, be sufficient to shadow forth the few and simple elements that regulate the production of great works. If studied patiently and with a purpose, I would confidently predict that in a very short time every photographer would exult in the manifest improvement indicated in his productions. Again, I have often said that much may be learned in our public picture galleries. The National Galleries, if taken advantage of, would prove an inestimable boon to the photographers of London; the study of two pictures alone would be of much advantage to them; I allude to Rembrandt's "Jew Merchant," and Reynold's "Lord Heathfield," and there are many others; but these two are enough to set up fifty photographers. Let them try and discover the sources of their beauty and grandeur, and labour until they can do something similarly effective, and the battle will be won. I believe the time is approaching, and it may not be far distant, when art-cultured photographers alone will be sought after, so that it is a matter of interest to be up and doing; but the spirit of yearning after better things is abroad. In the Photographic Journal of March 12th there is an excellent paper on the subject of "Photographic Art Education," by Mr. E. Dunmore, which I hope has borne good fruit; such papers should find a corresponding sympathy everywhere. There are pictures in our own National Gallery on the mound that I wish our own photographers would sometimes go and see. A very fine portrait of the "Provost of Peterhead" has been recently added to the collection, and would well repay several visits. I have a word or two to say about photographic landscapes. In the most of such I have seen there is a great profusion of detail; they bristle with it from one side to the other. This is surely not as it should be: the lens seems too all-seeing, and wants concentrative force. Detail is very charming when displayed on the chief objects in the picture, but, like many other good things, we may have too much of it. When all is equally smooth in a picture, we lose the charm of contrast. In Letters such has always been said of "Gray's Elegy;" but, when a painter sits down to portray nature, he gives prominence and detail only to those materials at and for some distance around his point of sight, and as the materials recede from his vision they become less distinct; he thereby gets not only variety of manipulation and colour, but that soft beauty and mystery so bewitching in nature and art. Would not the judicious use of diaphragms give less detail on the confines of a photographic landscape?

P.—I am not experienced enough to say; perhaps some member of our Society could answer that question. Regarding the remarks you have made, I think, with you, that in relation to art education, and as a means of it, the possession of a few mezzotint engravings of good quality would be invaluable. I can easily conceive of a great deal being learned in that way. I observe you have a very fine one over the mantelpiece. What amazing breadth of light and shadow as it is arranged: Photographs like that would be charming, and why should they not? I have great faith in the future of photography; when good and true art comes to be better understood, I do not fear the result. By the way, what think you of this Platinotype process? Have you seen many such works?

A.—I think well of the process; at first I felt them cold in tone, but they are really no more so than engravings, and I believe that cold feeling at first arose chiefly through my long familiarity with the brown tone of the silver process. I like the new process very much, and one special merit these pictures have is, in being like the carbon pictures, everlasting, if that be true. I saw recently, by our mutual friend, W. H. Davies, a remarkably fine set of Platinotype works on a large scale, which were about to be sent off to the Exhibition at Ghent. That process, it seems to me, has in it most excellent capabilities in the hands of a skilful workman. I hope that by-and-bye photographers will give serious attention to the size of their works. Size must give power in photography, as well as in painting; this was evident in the very fine exhibition we had here some years ago. I can never forget the effect of that large production from the gates of Lorenzo Ghiberti at Florence—those golden gates—pronounced by Michael Angelo as being "worthy of the gates of Paradise."

P.—I remember the work well. I trust the time is approaching when our Society will exert themselves to have another such exhibition; the spirit of emulation is always kindled by the works of others.

A.—True. And that reminds me that we are about to have an excellent exhibition at the National Gallery here of the works of deceased as well as living artists, from the earliest period down to the present time; this will be one of the features of interest for the Social Science Congress about to assemble, and cannot fail to be highly appreciated by all whose sympathies are awake to the progress of Scottish art. The pictures will be mostly from private collections, and the Royal Scottish Academy deserves the thanks of all lovers of art for bringing together so many productions that could not otherwise have been seen without considerable trouble.

P.—I am somewhat impatient to see that collection, as I have heard it is to be very fine. I now wish to ask you what books you can recommend me to read up upon rules of art. I understand there are many such works, and if you consider them of much use I shall gladly get them.

A.—Books upon art are no doubt of considerable interest to many, and there can be little harm in devoting your leisure hours to their perusal. You will find a number of aphorisms laid down in Reynolds' discourses to the students of the Royal Academy. John Burnet's works might also be consulted, and, more recently, the works of Ruskin—he is a mine in himself. But do you think you could understand rules without exemplification? I would rather you would go often to the National Gallery, and endeavour to find out what gives any special work its absorbing interest; for example, take the portrait of Thomas Duncan, and consider in your mind's eye how and by what means you can make a photograph resemble it in its mass and gradation, and work away till you can do so; that will do you more good than cramming your mind with rules which might only confuse you; besides, a painter's perceptions are his rule, or every painter is a rule to himself. Turner violated all the rules ever entertained; but his resources were such that he

* Continued from page 497.

could do so with impunity. His pictures always seem to represent nature as it is, in that mystical halo which envelopes them; objects seem to loom out to their actual dimensions, and he so treated his clear and beautiful skies as to give mass and consistency to the whole. As the high aim of art is to exalt and refine, I should like to say a few words on selection. It must be conceded that pictures are valuable in proportion to what they represent. Portraits of distinguished men and women are of special interest to us. The historical painter generally chooses the more salient points of history, points, perhaps, on which the weal or woe of mankind have depended. In landscape, the poetic painter evokes our emotional nature through that of his own; he either courts the beautiful for its own sake, or he touches upon scenes endeared to us from association. So are we moved by our old historical castles, our battle fields—and, indeed, all scenes hallowed by patriotism and genius. We look with complacency on a well-painted turnip field; but a painting of the field of Marathon or Bannockburn awakens our emotional sympathies and stirs our blood—incidents of horror or of heroism cling to our memory; "For men remember battles, floods, and wrecks." The poetic painter also studies Nature's moods; he chooses those hours when she is most replete with tenderness and feeling. At early morning, for example, when the earth is in bulk, and the still drowsy down is glimmering along the hill-tops, and tipping gently and sweetly the more underlying elevations; or in the evening, when the departing sun is shedding his last rays on mountain, wood, and stream—"soft hour that wakes the wish and melts the heart." The same influences are not felt in the blaze of noonday. When all is flash and sparkle, farewell to repose—everlasting repose, that fine element that ever strikes a chord in the feeling heart, and which is so essential to leading art. Have not Claude and Turner revelled in it, as it were? Paradoxical as it may seem, sound and action deepen its interest. When standing on the shore on a breezey evening, do not the angry action and cry of the waters intensify the repose of land and sky? And, on a calm morning, the solemn break of the wave as it rolls in along a great reach of sand is sublime. And so the swoop of an eagle across a mountain's crest—the roar of a cataract—the whirr of a moorcock—the voice of a solitary curlew—the reverberation of distant thunder—or the shrill music of the bagpipes in a Highland glen—all intensify the spirit of repose.

P.—Yes! I have not seen so many pictures as you, but we have often spoken of the influence of repose in nature and poetry. It is getting late, however. I shall endeavour to remember the hints you have given me, and I think I already feel that my future works will be better.

A.—I know you are in earnest, Philip, and let me now say that my remarks may be summed up in a few words. Consider that art education is of paramount importance, and remember that we must cultivate the heart as well as the imagination. Lose no opportunities of examining the best pictures, both in public and private galleries; by becoming familiar with such works, the principles of their excellence will gradually dawn upon you. Much will also be learned from mutual intercourse with older and more experienced men. Young painters are so raised as the saplings of the forest are drawn towards the light by the attraction of the more vigorous trees around them. Keep in mind, also, that the votaries of the fine arts, while keeping their eyes closely upon nature, are ever indebted to the works of their predecessors; *they* kindle the latent fires of emulation, and, at the same time, let us not forget the influence that literature has in elevating and expanding the mind, and we should keep the tree of knowledge ever budding. In perusing our best authors we are but contemplating the works of the painters in another medium. I have only to add, further, that I wish you to accept of my remarks merely as suggestions, as I would not, if I could, say anything that might affect your individuality. We shall meet soon, and so good night.

Photographic Exhibition in Vienna.—While partaking of the nature of a general exhibition, it is the aim of the Vienna Photographic Society to have the historical aspect of photography more especially represented. Therefore examples of all processes, new and old, will be es‸e i‸lly welcomed. No charge for space will be made, but all applications for the same must be made before the 20th Dec. 188‸, to Dr. Hcring, (president), Hauptstrasse 9, Vienna, who will send a proper form and rules on application. All exhibitors will be entitled to a diploma (but their exhibits must pass a hanging committee), and silver and bronze medals will be given to the most deserving.

FRENCH CORRESPONDENCE.

Anxiety of Photographers to be able to Prepare their own Gelatine Plates—Dr. Vogel's New Emulsion—A Curious Circular—The Story of a Fox—The Question of Measuring the Time of Exposure.

Photographers Preparing their own Gelatine Plates.—The results of my inquiries among a large number of photographers in Lyons, Marseilles, and Paris, lead me to the conclusion that the use of gelatine plates, bought ready prepared from the manufacturer, will with difficulty become general in France. All photographers are eagerly awaiting the advent of an emulsion in a liquid state which can be produced commercially, and with which they can themselves coat their plates. This advantage is already, to a certain extent, offered by the dry pellicle of gelatino-bromide, which can be bought ready made, and which, when reduced to a liquid condition by dissolving in water over a water bath, can be at once flowed over the plate. I am not aware, indeed, why this method does not meet all wants; perhaps it is because a large number of photographers find so much difficulty in making the gelatine flow properly over the plate, and then in drying it.

Dr. Vogel's New Emulsion.—Regarded from this point of view, the new emulsion of our eminent colleague, Dr. Vogel, promises to introduce a great improvement. It is said to possess a sensitiveness equal to that of the best gelatino-bromide emulsions, but surpasses them in stability and in facility of working. In this latter respect it is quite equal to collodion emulsions, and it keeps for a very long time. The preparation, reinforcing, washing, fixing, and drying can be as readily effected as in the case of collodion plates, while gelatino-bromide plates require a long time for washing, and at least six to eight hours for drying. Besides this, the plates prepared with this emulsion by any photographer are much cheaper than the gelatine plates which one buys. As is already known, it is composed of pyroxylin dissolved in acetic acid, and mixed with bromised gelatine; and it was considered interesting to learn what are the manipulations to be undertaken with this new composition, which is destined, no doubt, one day to play a great part in the production of negative photographs. It is very certain that the way so auspiciously opened out by Dr. Vogel will be followed by many others, and we may expect, at no distant period, to be inundated with a deluge of emulsions, sold, like this one, in bottles; thus photographers will be able to realize their dearest wish of having at their disposal a means of making their own plates.

A Strange Circular.—M. Christian, a photographer of Paris, has recently addressed to his colleagues a circular letter which I have just received, and to the contents of which I shall revert in my next letter. He says he has discovered a means of printing positives on paper, dispensing with the use of light, of albumenized paper, and of printing-frames, at the same time that he gets rid of all inconveniences of the original process—all this at the small charge of one penny. He offers, shut up in a dark cellar, to produce, in the space of two minutes, twelve copies of any negative that may be entrusted to him, no matter how hard it may be; the result will be the same as obtained by the ordinary process, but at one-twelfth the cost. "Winter is approaching," concludes the circular, "and my process will be a great help to you." Without presuming too much on my own acuteness in such matters, I am compelled, until better informed, to believe that the whole affair is rather a hoax. Probably the process consists in developing by the artificial light of some kind of lamp. The sensitive paper is, perhaps, held in the hand, exposed between the negative and a glass. A few seconds would suffice for the exposure, and a rapid development, followed by simple washing, would produce the image. To be brief, however, I shall, probably, soon be in a

position to throw further light on the subject—that is, if it is worth while doing so.

The Tale of a Fox.—These processes which seem so marvellous, and which nevertheless promise such excellent results, always remind me of a story which one of my friends—an amateur photographer, generally more fortunate in word than in deed—used to be fond of relating. "When I am in the country," he would say, "I like to go into the woods where the foxes have their lairs, and there I set up my camera. So soon as of an evening a fox appears, I take his photograph, and immediately afterwards kill him with a shot from my gun; then I return home carrying in the one hand the dead beast, and in the other, a portrait of him while alive." *Si non e vero e ben trovato!*

The Importance of being able to Measure the Time of Exposure.—My recent experiences with gelatino-bromide plates have more than ever convinced me of the necessity there is—more especially for amateurs, and not less for professional photographers—to be able properly to estimate the requisite length of exposure. On this subject I have read with great interest the communication made by Mr. Ellerbeck to the Liverpool Amateur Association. I think it, however, right to point out that the means adopted for calculating the time of exposure should be susceptible of as general an application as possible. For this reason, in my own method, a description of which is at the present moment in the press, I omit all mention of the numbers of the lenses, and of the names of the makers. It makes no difference whether the lens has been produced by Mr. Ross or by Mr. Dallmeyer—the only factors required to be known are the character of the aperture for admitting the light, and the focal distance when the image is found. My investigations have been carried on with lenses of all the best makers, and I have assured myself that the character of the lens has very little influence on the length of the exposure, all other things being equal—that is to say, the aperture and the focal distance remaining the same. When my calculations of the duration of the exposure have been published I shall be glad to take a note of all the criticisms and observations to which they may give rise, for it is from the collision of ideas that light is produced. Leon Vidal.

OXALATE AS AN INTENSIFER.

BY H. L. T. HAAKMAN.

In No. 1,153, "Bromo" wants to know a ready and efficient method of cleaning the gelatine films off waste dry plate negatives. In reply, I beg to say that the ready cleaning depends entirely upon the treatment the plate has undergone.

If the plate has been simply coated or only developed, the film will easily dissolve in tepid water, and may afterwards be thoroughly rinsed under the pump. When the negatives have been strengthened with bichloride of mercury, the films are very tough. They may then be soaked in warm water and scrubbed with common table salt, as stated in the Year-Book.

I generally put my waste plates in a large basin filled with cold water, wherein I dissolve some washing soda. After two or three days' soaking, the films—even those toughened by bichloride of mercury—may be readily removed under the pump, srubbing them with a tuft of cotton wool.

When I first tried the oxalate developer, I used the acid oxalate, and all the films came off in no time. Consequently a ten per cent. solution of oxalic acid in water will rapidly clean the plates.

Varnished negatives clean as easily as unvarnished.

Capt. Francis Turton r commends oxalate as a redeveloper, and, so far as I understand him, as a means to intensification by after treatment with bichloride of mercury and ammonia. Acting upon his hint, I think I discovered it does something more. The first plate I treated by this method was a cloud negative, fixed and dried, perhaps two months old, and which during the whole time had stood in the light. When the plate was developing, some visitors called, and I was obliged to leave it in the oxalate bath, and there not being enough of it or the developing pan not being quite level, I found on my return that only half of the plate had come up to proper density, and the other half, having run dry, was undeveloped, or only partly so. In this condition I fixed and dried it, in order to judge by a worthless plate what Capt. Turton's method of intensification would do. I put this plate in the light in some fresh oxalate. To my great astonishment the intensification went no (or only a very little further) in that part of the negative that had been properly developed; but in the undeveloped part intensification came very readily, and, what is more, plenty of detail came out which, previously, was invisible. In fact, the whole plate came up to rather a good "ensemble," the boundary between the primitive developed and dry part being scarcely visible. I forgot to say that the operation of redeveloping was conducted in full daylight. Encouraged by this first trial, I treated in the same way a couple of negatives which, having been taken in a very dull light, were all right in the centre, but rather void of detail at the edges, where trees on the one hand and a hedge on the other formed the borders of the picture. The effect was really astonishing, plenty of detail coming out where it was wanting. In fact, I believe it is quite possible to reverse the mode of developing, fixing the plate first, and developing it afterwards in daylight. So soon as as I have an opportunity I shall try to do it. The principle is not new, for you may remember that some twenty or twenty-five years ago it was advocated in the Petschler and Mann's collodio-albumen process, though, I think, rarely put in practice.

Your leader on "Halation" has been of great service to me. Photographing nothing but landscapes, I now always cover the backs of my plates with black varnish (asphaltum dissolved in benzole) which generally, but not always, proves a cure.

I find that the emulsion should contain plenty of gelatine (1½ gelatine to 1 silver nitrate); and next, that halation rarely shows itself when the plates, having been fully exposed, develop quick; but when the development, in consequence of under-exposure, takes long, the well-lighted parts are apt to be over-developed.

Your note on page 464, about the solubility of gelatine in alcohol containing an organic acid, I have brought into practice. To about 50 cubic centimetres washed emulsion, melted at about 95°, I add 50 cubic. cent. absolute alcohol containing 2 cub. cent. acetic acid. The result was a beautiful emulsion which ran over the plates like collodion, and set rapidly. In a couple of days I hope to give this batch a fair trial.

In the beginning of this season I made several emulsions with the addition of iodide potassium, according to Captain Abney's hint. Although Dr. Eder prohibits the use of a sodium salt as being worse than useless, I must say that this sort of emulsion gave me some beautiful, really first-rate negatives. There is, however, one drawback in my hands: they take enormously long to fix, and if they have been somewhat under-exposed, even if the development has brought out all the details, they almost refuse to fix at all, and retain a sort of blue veil, which I cannot get rid of. Would Captain Abney, perhaps, kindly explain the reason why?

Allow me, in conclusion, to draw your attention to the *two* methods of emulsioning published by Dr. Eder in the *Photographische Mittheilungen.* I succeeded so well with them, and they are both so simple, that I think you will confer a great boon on your English readers by giving them the translation. But Nelson's No. 1 gelatine being alcoholic and apt to generate ammonia, I would caution your readers to use French gelatine for Dr. Eder's second method, when the emulsion has to be boiled for half an hour. I say, try it; the results are splendid.

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MODERN MICRO-PHOTOGRAPHY.

Two months ago we announced in these columns an important discovery made through the medium of photography. We showed how the micro-camera was able to see minutely where the eye was at fault, the discovery made by the sensitive film in this case being not simply a bare scientific fact, but a matter calculated to influence everyday life, and bearing vitally upon our knowledge of surgery and blood poisoning. We showed how a clever micro-photographer, Dr. Koch, had come to the aid of Professor Lister, of King's College, and adduced photographic proof of the wisdom of the medical treatment pursued hy that eminent surgeon—treatment, we are glad to say, that has lessened the percentage of deaths among surgical patients in our hospitals in a wonderful manner.

Mr. Lister's theory, it will be remembered, is that pyæmia, blood-poisoning, and the other terrible diseases that so frequently supervene after a surgical operation, are due wholly and solely to bacteria, or tiny organisms that are for ever floating around us. These bacteria pervade the air we breathe, and the dwellings in which we live, and are unceasingly seeking an opening to do mischief. An incision in the human body affords them a glorious opportunity; but Mr. Lister, by making abundant use of carbolic acid, which is lavishly applied to operating knife and bandages, manages now to keep them at hay. But the difficulty has been to bring the crime home to the bacteria. Under most circumstances there is little difficulty in detecting them with the microscope, but when they bury themselves in human tissue, all trace of them is lost to the eye, and indeed the doubts that were thrown by some upon Mr. Lister's theory were due in a great measure to the fact that the surgeon was unable to demonstrate the actual presence of bacteria in the tissue.

This we know Dr. Koch has now done. Tiny organisms, of the same colour as the tissue itself, he has been able to discover and magnify some 700 times. He does it by staining the tissue violet first of all, and then making use of a very simple and efficient method of lighting his preparation. This method we now bring to the knowledge of our readers. Artificial illumination was not powerful enough, it seems, and direct sunlight gave images so hard that the detail of the delicate little organisms was destroyed. In the end, he found that by passing sunlight first through an ammoniacal solution of copper—a blue liquid, be it remembered—and still further diffusing the light by ground glass, he was able to solve his difficult problem. In Dr. Koch's case, of course, the lighting was the main difficulty, and our readers will be glad indeed to read the doctor's own brief account of his *modus operandi*. He says:—

"The micro-photographs that I forwarded to Professor Lister represent, for the most part, images magnified seven hundred times. I employed, for the purpose of securing them, an immersion lens by Siebert and Kraft, opticians of Wetzlar, and I may say that the instruments of these makers are particularly well adapted to micro-photographic work. Lens No. vii was the instrument chosen by myself, and for my own part I prefer the system to that of Hartnacker; I prefer it even to the oil immersion system of Zeiss, when the latter is not provided with a correction lens, or Woodward's so-called amplifier.

"The tube of the microscope—or, rather, the tube in connection with the microscope—was capable of drawing out to a length of two metres. The microscope and tube were horizontal, and, in place of the eye-piece, a small bellows camera was attached, care being taken, of course, to exclude light at the junction of tube and camera. I employed the wet collodion process, practising it in the ordinary manner.

"I managed the lighting of the object to be photographed in the manner following. The object was a thin microscopic preparation, and so that sufficient illumination should be concentrated upon it, I employed sunlight, reflected by means of a heliostat. A wide-angle condensor was, moreover, employed to concentrate this powerful light. At the same time, I did not use bare sunlight, which, as is well known, gives not only hard pictures, but pictures rendered defective by interference phenomena. I allowed the sunlight to pass through an ammoniacal solution of copper rendered as monochromatic as possible, and then diffused and softened it by allowing it to pass through ground glass. To this I attribute, in the main, the sharpness and purity of my pictures. Using diffused sunlight through ground glass in this way, I find that an exposure of about two minutes suffices in the case of an enlargement of seven hundred times.

"Of course, with gelatine, I shall be able to make shorter exposures, and I am just now engaged in making test experiments relating to its sensitiveness. I am also testing gelatino-bromide in respect to its sensitiveness in particular for violet and blue light, as also for green and yellow, my object being to see how far I can micro-photograph preparations stained blue; for in pathology and histology the microscopic preparations are, for the most part, of this tint. The question of colour enters also largely into the matter when bacteria are to be reproduced; but I have little doubt that the gelatino-bromide process will lighten the labour of the micro-photographer very considerably."

A THIRD VISIT TO THE EXHIBITION.

The Autotype Company and the Woodbury Permanent Printing Company both make a handsome show. The Woodbury Company have a series of "Portraits on Opal" (127), carbon enlargements, that prove once more that the process can compete for delicacy and harmony with any other method. A frame of Woodburytypes (160), also exhibited by the Woodbury Company, show that photo-relief printing is still flourishing and improving; while the enlargements of the Company (183-4-5) are real triumphs of this branch of the art, and superior in many respects to anything of the kind that has previously adorned the walls of the Pall Mall Gallery. The most wonderful things shown by the Autotype Company are the collotype prints. The cathedral pictures printed in an ordinary printing press (149, 161) with fatty ink measure fourteen or sixteen inches; difficult subjects though they be—the nave of Norwich Cathedral, interior, &c.—these fatty ink pictures exhibit a marvellous degree of vigour combined with softness; in a word, the pictures have lost none of their photographic delicacy in their transformation into mechanical prints. The Autotype Company also show some magnificent enlargements from Mr. Thomson's China series, "Fishing Boats in Chinese Sea" (157) being one of the most successful and original of the series. The "Late First King of Siam," a fine three-foot picture, also from a negative of Mr. Thomson's, is another example worthy of note; this grand series of Eastern pictures, boldly printed, as they are, by the Autotype Company in permanent pigments, affords a fine example of the value of

photography, and how rapidly it is treading on the heels of engraving.

Messrs. Lock and Whitfield exhibit several fine and vigorous portraits, and one study, "Afternoon Nap" (131), which is a bit of very nature. Mr. A Debenham shows a forcible portrait of Tracey Turnerelli, of golden wreath renown, and several studies, of which, perhaps, "The Wanderer" (110) and "Looking to Windward" (111) are the best, although the "Wanderer" appears, perhaps, a little too well-fed and contented as wanderers go, and the sailor's dress and appearance suggest anything but dirty weather. "A Study of a Lady in White" (204), and the "Flower Gatherer" (208)—the clear soft features of the latter especially—are the embodiment of very fine work indeed. Mr. S. Fox shows his skill in Wick Hall, Brighton (113), and Mr. T. F. Lloyd contributes a frame of neat little sketches, "Studies of Children" (132).

Mr. H. S. Mendelssohn's Rembrandt Studies" (119—123) are likely to command a good deal of attention. One fair face in a bonnet is rendered with exquisite art and grace; the soft cheek and clear eyes are eloquent of sweetness and beauty. The artist is here very manifest, and his work compels admiration. Mr. Mendelssohn achieves success by his masterly lighting, which is soft and pure, rather than brilliant and vivid.

Messrs. Hills and Saunders' contributions (135, 232, 233) comprise a fine carbon enlargement upon opal (135), a picture similar to that which gained a medal last year. It is a portrait of a lady most delicately limned, the white lace and drapery and parasol all rendered with exquisite softness and finish. A frame of cabinet portraits also deserves mention, alike for the skill in posing as for their unconventional treatment; no two backgrounds are alike. M. T. R. Annan shows an enlarged portrait, in carbon, of the late Dr. Barclay (133); and Messrs. W. and D. H. Fry (134), in some panel portraits, demonstrate that they can skilfully treat difficult subjects, as the models in white here shown, undoubtedly are. Messrs. Lombardi and Co. exhibit several phases of good work upon opal and paper (138, 147, 254, &c.).

Messrs. E. Day and Son send "Robin Redbreast at Home" (139)—something of a feat in photography, the chubby little fellow sitting stolidly upon a branch of fir. A snow scene (245) by the same firm makes a pretty Christmas picture. The best of Mr. E. Gregson's portraits is the girl on the swing (150). Messrs. Wratten and Wainwright (151) exhibit a *tour de force* in their enlargement of a group of soldiers, everyone of whom is sharp and clear, the negative, we believe, being by Mr. Cowan. "Reading to Granny" (165), by Mr. W. Gillard, is a picture on which, evidently, a great deal of pains has been spent; it is a composition picture—an old lady listening to her grandchild reading. The conception is better than the treatment; the old lady's face is a capital study, but the girl is hardly reading. It is an ambitious attempt, and if Mr. Gillard has not been completely successful in this particular instance, we hope he will not be discouraged thereby. Mr. Parkison exhibits a group taken by electric light. Mr. Ritchie shows some of the results of his arabin emulsion, among which are a pair of excellent pictures—taken on emulsion—two years old (234). Some instantaneous views of shipping, "taken on board a steamer going nine knots an hour," are also well worth looking at.

Mr. G. W. Williams' instantaneous views of "Margate Sands" (170) remind one of a picture by Frith; they are full of life, and clear and sharp to a degree. They betoken not only skilful manipulation, but a thorough knowledge of lighting; the busy groups of holiday makers are not simply black silhouettes, but animated beings whose features almost can be studied. Mr. John Hazard shows a typical "Wedding Group" (172), and some winter views. Mr. G. E. Alder (177, 263, &c.) is represented by several excellent frames of portraits taken by the Luxograph light, for the most part characters from fancy dress balls. Half-a-dozen pictures are shown by Mr. James McGhie, of which the best is (199) the "Falls of the Clyde," the transparent character of the falling water being rendered with much skill and taste. The "Arch of Septimus Severus" (200), at Rome, is also a clever bit of work.

Notes.

An International Exhibition opens in Vienna in January, to which British photographers are invited.

Mr. Spiller, as will be seen in another column, has lost no time in discovering what was amiss with some of the shining black cards upon which panel portraits are mounted. The most brilliant of these cards were found saturated with common salt, a body that attracts moisture sufficiently to account for deterioration in the mounted picture. A solution of silver, as everybody knows, is one of the readiest means of detecting the presence of salt, so that every photographer has the test in his own hands.

The soft subdued lighting of Mr. Mendelssohn's portraits in the Exhibition is the subject of general remark. We pointed out, immediately after a visit to that gentleman's establishment at Newcastle, that Mr. Mendelssohn has not a square inch of bare glass in his studio. He has few curtains, but covers the whole surface of his glass with tissue paper. This can be replaced in an hour if it gets yellow and dirty, while soiled ground glass is very troublesome to clean.

A play has been produced in America in which a faded photograph supplies the means of identifying the hero after years of oblivion. It seems strange that recent playwrights should not more frequently call upon photography as a *Deus ex machina*, for the purpose of solving a complicated plot. In our experience, the Octoroon is the only English drama in which this is done.

And in this case, the author, Mr. Boucicault, has made a very silly mistake. While a person is having his portrait taken, a man suddenly appears from behind, and murders him. The sensitive plate thus secures a picture both of victim and murderer; but as the camera is subsequently knocked to pieces, and there is no talk about development, it is not very clear how the photographic proof of this far-fetched action is forthcoming. Perhaps this abortive attempt of Mr. Boucicault to employ photography as a dramatic incident has acted as a deterrent to others.

In all cases of "police supervision," it is now an invariable rule to register a photograph of the habitual criminal. When released from prison, the convict under "supervision" may reside where he pleases, but is compelled to name the police station at which he proposes to report himself from time to time; and so that he may be better under the eye of the police at a provincial town, the chief constable is provided with a photographic portrait and a schedule of particulars concerning his charge.

The Secretaries of the Royal Society advertise for claimants for the sum of four thousand pounds to be given away for the encouragement of research. Any photographic experimentalist, therefore, who thinks his work deserving of his country, should apply before the end of December next. This makes the fifth annual grant, and a report will now be made showing what the country has gained in return for the twenty thousand pounds expended. So far, no very great discovery or invention seems to have resulted from this uncalled-for generosity on the part of Government.

Many have been the attempts, more or less successful, to apply photography to surveying, but we recently heard of a happy application of the art made by Captain M'Callum, R.E., when employed upon such work in the Malay Peninsula. In making trigonometrical surveys, it is sometimes difficult to mark the various points sufficiently well to recognize them hereafter, for although they may appear plain enough on a map or plan, and be very obvious as soon as discovered, such spots want a lot of finding in a wild landscape. In Scotland, Wales, and other hilly districts some high peak is usually chosen for the purpose, and a cairn of stones marks for miles around whence the observations have been made. But the surveyor has not bare country to deal with always, and sometimes Nature makes a mark that at a distance might well be taken for a trigonometrical point. In the Malay Peninsula, therefore, Captain M'Callum resorted to the clever plan of photographing his survey stations, and marking upon the landscape pictures such information as would lead to their ready identification.

M. Izard recommends the following plan of stripping photographic films from glass. Make a solution of rubber in benzole, and coat your negative with it; when dry, apply a film of collodion, yet another of rubber, and finally, another of collodion. A narrow strip of black paper is then cemented to the margin of the plate all round, and this, when the film is dry and is stripped with a penknife, makes a suitable frame.

It seems that the Balloon Society has had enough of London fogs, and is resolved to get rid of them altogether. This is good news indeed. The help of the President of the Chemical Society and of the Photographic Society of Great Britain has been invoked, and the whole thing may now be regarded as good as accomplished. The London fogs are to be vanquished before even the North Pole is discovered, so that when Commander Cheyne and his comrades depart, they will have the satisfaction of leaving behind a bright and exhilarating winter for our use.

By the bye, the only dissentient voice at the foggy debate appears to have been Mr. Henderson's, who, as he practically put it, "failed to see what part, so far as actual aid is concerned, photography could play in the matter." Mr. Henderson evidently thought photographers had quite enough fogged negatives, without going up in a balloon to get more.

Topics of the Day.

DEVELOPMENT OF GELATINE PLATES.

BY W. T. WILKINSON.

My own experience, working the gelatine process side by side with wet collodion, and by a careful and wide examination of the work of others in gelatine, has confirmed the belief (or certainty) that even leaving quick exposures out of question, as good results can be got on gelatine as by the wet process, even when working it in its most sensitive and favorable condition, so that when the immense advantage of shorter exposure is considered and allowed its full value, not the slightest doubt exists, that for commercial photography, the gelatine process is the best; but (and there is a "but") to get the highest quality of result from gelatine it is in the highest degree necessary that careful and intelligent manipulation be resorted to, remembering, when examining the beautiful thin negative, that what gelatine lacks in visual thickness it makes up for in non-actinic vigour, and also that it is a process of only about three years' (general) use, and is constantly being improved both in quality of result and ease of working, whilst the wet collodion is thirty years old, and is practically in the same condition as when first introduced, proof of which can be seen by a perusal of my paper read before the South London Society in 1876, entitled, "Archer's Process."

This being so, it now remains to consider the best means of working gelatine plates so as to get the best results possible.

We will begin with the ferrous oxalate developer; after a long series of experiments under every conceivable condition, I am obliged to come to the conclusion that in no case can the best results possible be got that the gelatine plate is capable of giving when ferrous oxalate is used as the developer of the latent image. This conclusion has not been arrived at hastily, but after careful comparative experiment, the gravest fault being the impossibility of getting detail in the high lights, especially descernible when masses of white drapery have to be rendered.*

Ferrous oxalate being wanting, we will proceed to consider the best method of using the alkaline pyrogallic.

A careful perusal of the instructions sent out by the different makers for use with their plates exhibits a considerable amount of ingenuity in framing a developing solution that shall be (apparently) different from that recommended by a rival; but when reduced to paper, side by side, it will be found that practically all are very nearly alike.

Some makers aver that pyrogallic is best kept in a dry state, and dissolved as required, recommending the operator either to weigh out in small quantities, or to guess the amount for each plate. Both these plans are bad in principle: in the first instance, pyrogallic is difficult to weigh out in small quantities with any degree of certainty; and in the next place, by no amount of practice can the proper amount be guessed to give absolute certainty; besides which, a bottle of pyrogallic once opened deteriorates as rapidly dry as in aqueous solution, while there is the chance of introducing dirt when opening in the dark room.

Leaving the pyrogallic, we will consider the restrainer and accelerator. Some makers direct the mixture of ammonia and bromide to be used in drops, others in much larger quantities. The dropping plan is very uncertain, as by such a very little over, the plate is ruined.

Careful consideration of the above points is fully met by the formula published by Mr. B. J. Edwards. This formula is suited for all kinds of gelatine plates. The pyrogallic keeps well; in fact, I have some now, three months old, which gives as good a negative as a freshly prepared solution. There is all the requisite latitude, besides absolute certainty as to result.

* This, it must be remembered, is but the personal opinion of the writer. —Ed. P.N.

To prevent confusion, it will, perhaps, be as well to give the original formula, which stands thus:—

Solution No. 1.

Pyrogallic acid	1 ounce
Glycerine	1 ounce
Spirits of wine (methylated)	6 ounces

Solution No. 2.

Liquor ammonia ·880	1 ounce
Bromide ammonia or potassium ...	60 grains
Glycerine	1 ounce
Water	6 ounces

Solution D (developer).

Solution No. 1	1 ounce
Water	15 ounces

Solution A (accelerator).

Solution No. 2	1 ounce
Water	15 ounces

To use for a properly exposed plate, take equal parts of each solution D and A. In solutions Nos. 1 and 2, white sugar or honey may be substituted for the glycerine.

The proportions given above for a properly exposed plate leave nothing to be desired, unless the plate be apt to give thin flat images, in which case solution D will be best compounded of—

No. 1	2 ounces
Water	14 ,,

A still being the same. On the contrary, when the density is likely to be too much, as little as half-an-ounce of No. 1 to 15½ of water may be used. By thus modifying the pyrogallic solution, any desired degree of density may be obtained, and, as to the exposure, the solution is regulated in the same manner by using less or more as the exposure has been long or short.

To develop a plate, the exposure of which it is anticipated has been far too much or is very uncertain, it is best laid in a dish and covered with the requisite quantity of pyrogallic solution mixed for a weak plate with (say) two ounces of solution; now add one dram of solution A, and allow to act for a minute or two, repeating the dose until the image begins to appear. When the image begins to appear, the dish may be covered up and left for five or ten minutes, when, on examination, a good negative will be the result. A more elaborate method, and, perhaps, more reliable, is to make up solution No. 2 in two solutions, keeping the ammonia and bromide separate, diluting the concentrated solutions as usual with water, and then going cautiously to work, adding the full quantity of bromide to the pyrogallic, but only adding sufficient of the dilute ammonia to start the action; then leaving the result to time. Under-exposed plates can be managed by a reversal of the above method, using solution D weak, as directed for dense plates, and using double the amount of ammonia solution to bromide, but always in a dilute state. Do not be in a hurry; give the plate time; and, if you are impatient, cover up the dish and go away for a time; on your return you will see a far better result than if you had tried to hurry the process.

To develop a picture containing violent contrasts, mix equal parts of D and A, and add five times the bulk of water; place the plate in, and give about half-an-hour to an hour to be finished in.

After the image has been properly developed, the next stage is to well wash it, back and front, and then immerse in a tolerably strong solution of alum. The functions of this solution are twofold: first, as a guard against frilling in the subsequent washing, and also to clear out of the film the remaining pyrogallic from the developer, and avoid red stained shadows. The time of immersion is immaterial, so long as no less than three minutes are allowed. After again washing, the plate is removed to the hyposulphite for fixing; the strength of the hyposulphite is rather important, as, if too strong, the film will frill; and if too weak, the time of immersion is too long; about half saturation is the best strength. If any tendency to frill be suspected, the plate ought to be immersed in a solution of chrome alum upon leaving the hyposulphite bath; after this, wash thoroughly under the tap, and then place in a grooved tin box containing clean water, which ought to be constantly changed for three or four hours. Now if, after rinsing, a weak solution of cyanide be flowed over the film, and well washed off, the image can be easily and readily intensified by means of pyrogallic and silver.

Some photographers complain of the difficulty of getting sufficient density in their negatives; but, if care be used, and attention paid to the strength of the developer used after developing the first of a batch, little or no trouble ought to be experienced in getting just the proper amount of density. If, however, as may sometimes happen, the negative is not dense enough, if only a little be required, pyrogallic and silver will give it; but if the lack of density be considerable, then Edwards' formula for mercury intensifier is the very best that can be used. Do not on any account (except for copies of drawings, &c.), use the plan of bleaching with mercury, and then blackening with ammonia, as there is so little latitude that the best result is difficult to attain with the mixed mercury, potassium, and hyposulphite solution. The colour of the negative after immersion is so near the old collodion colour that it is easily managed, and, if not used too strong, is perfectly under control.

With careful manipulation a gelatine negative need never be stained; but as it sometimes happens that they do get stained, especially in intensifying, it will be as well to mention that one of the first remedies that ought to be tried, and which, in most cases, will be found efficacious, is immersion in fresh hyposulphite. A weak solution of hydrochloric acid in alum water will also remove stains. Weak solution of cyanide in alum water will remove silver stains contracted from sensitive paper. The most obstinate stains can be removed by using a mixture of common salt and sulphuric acid, as directed by a formula published in the News a short time back.

When this paper was projected, I intended to give some account of the characteristics of different makers' plates, and with that intention procured from various sources half plates by Wratten and Wainwright, Rouch, Mawdsley, Swan, Fry, the Britannia, Archer, and Bennett. Each plate was exposed in the studio as rapidly as possible, two cartes on each; but the result was that all plates in the market will give good negatives, providing care be taken to use them intelligently; and if a fresh batch does not give the same results with the same developer as a previous one, alter the developer to suit.

In conclusion, I might mention that it is not necessary to use a fresh lot of developer for each plate, but that four ounces will develop at least six plates, when done one after the other; also, that over-dense negatives can be reduced by a weak solution of perchloride of iron, followed, after thorough washing, with hyposulphite; or else the negative may be bleached by immersion in a solution of bichloride of mercury.

The "Topic" for next week will be, "My Infant Studies," by T. G. Whaite.

ON INSTANTANEOUS SHUTTERS.—A NEW ONE.

BY VINCENT BEECHEY.*

It was with very great pleasure that I found myself once more surrounded by the members of the old Society and many of the well-known faces, and all the old harmony and activity present at the meeting. The principal subject of the evening seemed to be instantaneous photography, and two very ingenious shutters were exhibited by Mr. M. Noton and Mr. A. Coventry. Having

* A communication to the Manchester Photographic Society.

written respecting the principle of tho former, I should have said no more about it except that Mr. Noton has certainly worked out that principle in a most effectual manner. A letter from him on the subject afterwards set me thinking on the various conditions which enter into the several constructions which already exist, another of which I venture to contribute for your inspection this evening.

It is possible that somebody else may have hit upon the same contrivance. If so, I have not seen it. But it seemed to me that all the shutters move through a greater space than there is any occasion; and that the spot where the shutter ought to be is the optical centre of the construction; that the little trigger often used for ordinary exposure might be easily converted into one for instantaneous or any other exposure; and that such a stop would be perfectly free from jerk, and out of the way in every respect. I had the one I now send constructed from my model by Messrs. Ross and Co. It is applied to a rapid rectilinear, but would be even more easily adapted to a symmetrical lens.

The diaphragm, A S S¹ C B, oscillates on the centre, C¹, close to the fixed stop between the lenses of the combination. It has an aperture, A, in its middle equal in diameter to the largest stop of the lens. As placed in fig. 1, it will be seen that the

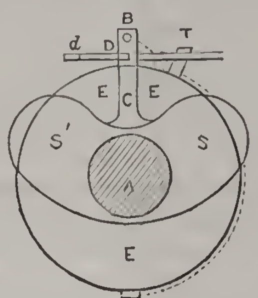

Fig. 1.

apertures will agree and full exposuro will take place. In this position it is held by the first catch, D, on a little trigger, T D *d*, which turns on a pivot at T. The dotted line round the lens from B represents a thin india-rubber band, which acts as a slight spring in drawing B to T. In this position any length of exposure for ordinary collodio-bromide plates may be given, and, on releasing the trigger, concluded. But there is another catch on the trigger (*d*) at which the dark part of the diaphragm (S¹) will cover the aperture. If the trigger be now loosed the diaphragm will move rapidly from S¹ to S past the aperture, which will remain open only during the instant at which the one aperture crosses the other.

The exposure thus given is *perfectly instantaneous*—more rapid, indeed, than I think the most sensitive plate would *properly* imprint. I have, therefore, added another little spring catch, which holds back the trigger, so that the diaphragm is free to be moved by a finger at B. If so held, whilst S¹ covers the aperture it may be released as gently or as rapidly as desired, and so smoothly that no shake or vibration can occur. Wishing to send it in time for the present meeting I have not been able to try the different exposures; but I think it will prove one of the best shutters extant.

But, now, as to the principle of this and other instantaneous shutters. It is generally faulty. From figs. 2 and 3 it will be

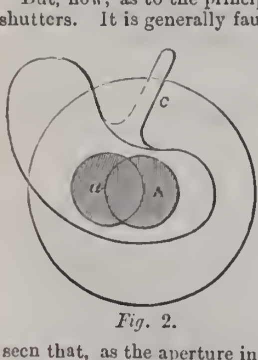

Fig. 2.

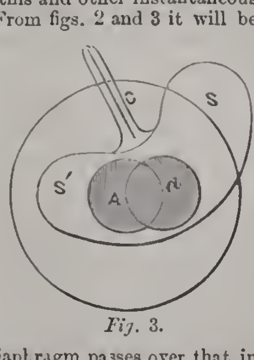

Fig. 3.

seen that, as the aperture in the diaphragm passes over that in the stop, the open portion is alternately to the right and left of the centre, before or after full exposure. The result is *a change in the optical centre of the lens*, and a near object really moves alternately a little left and right before the distant ones. I noticed this very distinctly on the screen as I moved the diaphragm *rather* quickly across the field backwards and forwards. The same effect, and to a greater extent, accompanied by another greater evil, attends the action of ordinary drop shutters, the upper and lower portions of the aperture being ultimately open, and, consequently, a vertical change of optical centre, accompanied by an additional flare of light longitudinally across the centre of the field, the horizontal centre receiving *much greater exposure*. This evil really accompanies all instantaneous shutters in which the illuminating aperture passes across the aperture of the stop. Try it, and it will be seen that a change of the horizontal line in passing takes place.

I fearlessly assert that the only instantaneous stop which in every position gives the same perfect figure is one upon Mr. Noton's principle of a central enlarging aperture; and I think his is quite sufficiently instantaneous for actual work, if it only acts without any jerk or shake, which I doubt.

But now, after all, are any of these what we want for landscape work? Do we want even equal instantaneous exposure? I think not. We certainly want longer exposure for the foreground, and shorter for the distance and sky. Is not, therefore, the best principle that of the ordinary sunshade? Together with my instantaneous diaphragm I forward my front sunshade as thus adapted. It is merely a nicely-made one with longer ends, so constructed that it is rigidly fixed by the punched dots at C

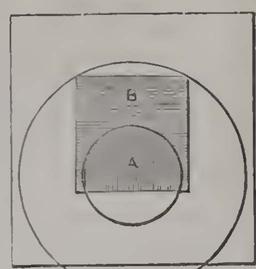

Fig. 4.

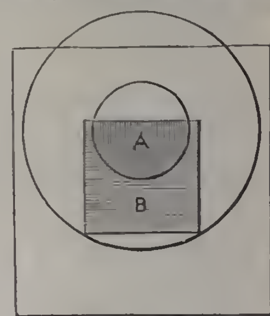

Fig. 5.

to the left hand end, L, but is tightened or loosened, as required, by the right hand milled-head, R. When focussing, &c., it is made rigid so as to remain up; but by loosening the milled-head R, it falls quite easily. Then, by turning the left milled-head,

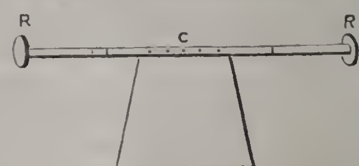

Fig. 6.

L, by the finger and thumb, an exposure of greater rapidity may be given without any shake, and the *foreground will be very much longer under exposure* than the distance and the sky.

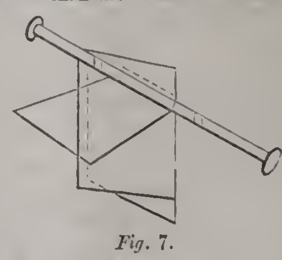

Fig. 7.

Again: I say—Is not this what we want for landscape work? For objects in motion our spring triggers may, perhaps, be necessary; and in such cases I venture to think (whatever its little imperfection may amount to in practice) the simple diaphragm shutter I have given above will be found the most rapid (if wanted), or the most smoothly-gliding gradual shutter in use.

Correspondence.

BLACK MOUNTS FOR PANEL PORTRAITS.

Dear Sir,—I am indebted to you for an opportunity of examining some thick black cards to which objection has been made on the score of causing the rapid fading of photographs mounted thereon, and have compared them with other two "panel mounts" which were kindly sent to you by Messrs. Sarony, of Scarborough, as being quite satisfactory when employed for the same purpose.

They measure all alike $8\frac{1}{4}$ by 4 inches, with gilt bevilled edges, and differ only in substance and weight; those to which exception was taken being heavier (356 and 403 grains respectively) and made of eight sheets, instead of seven in the good cards (weighing 300 grains each), upon which the name and address were printed in pure gold. The latter sort seem to be coated on the face and back with Indian ink, whilst the "bad" cards are jet black with a thicker layer of pigment, apparently lamp-black or Frankfort black, which can be more easily scraped off than the thinner coating of Indian ink. These pigments were found to be easily combustible, as though composed entirely of carbon; portions of the cards themselves were then burnt, and left of ash seventeen and twenty-three per cent. respectively; the better quality giving the higher proportion of white ash, which in both instances was mainly kaolin.

As a matter of primary importance, I tested both qualities for hyposulphite by the iodide of starch process, but found, contrary to expectation, that both alike were free from this impurity, so that the fading was not due to the presence of hyposulphite. On further examination, I soon discovered that the bad cards were loaded with soluble chlorides, the good mounts scarcely containing a trace. Here, then, is a difference to which attention must in future be directed, for nothing is easier than to cut the cards into strips, soak them in equal measures of pure water, and, after an hour's immersion, test the clear solutions with nitrate of silver. In my experiment the bad card gave a heavy precipitate, and the good card only a faint opalescence. The origin of the chlorides may either be a too liberal use of bleaching agents, or the employment of brackish water in the preparation of the paper stuff from which the card is built up. However derived, there is no doubt that the presence of soluble chlorides must be prejudicial, as tending to produce exactly those effects of fading which are so often apparent in show-cases at the sea-side, where damp air and moist conditions invariably affect the specimens exhibited if they be the ordinary results of silver printing.

One very curious result of the impregnation of the cards with so much saline matter was that the pores of the paper were filled with salt instead of air, rendering the cards less buoyant, so that they sank immediately in water, whereas the good cards floated for many hours. This led me to attach some weight to your suggestion that they might possibly contain sulphate of baryta, but by fusing the ash with carbonate of soda, and examining specially for barium, none was found.

The hygroscopic qualities of the cards were not so widely different as I expected to find them, varying only from $8\frac{1}{2}$ or 9 to 10 per cent.; but when the photograph is mounted upon such blocks of salted material, the transfer of soluble chlorides to the picture surface must be very detrimental to its permanence, as already remarked.—I am, dear sir, yours very truly, John Spiller.

ON THE USE OF SINGLE LENSES IN PORTRAITURE.

Sir,—Will you allow me space for a few words on the above subject? When the sensitiveness of the Daguerreotype plate was materially increased by the addition of bromine to the film, or, as it was then called, "quick stuff," the practicability of taking portraits by photography first became evident; but still the process was so slow that with the single lens (the only one then, however), the exposure was very protracted. There was a demand for something quicker, and this was satisfied by Professor Petzval when he invented the portrait lens.

This lens was avowedly but a makeshift. Everything was sacrificed to speed; but speed was the first requirement, and the lens was universally used, and continued to be, even when a considerably more sensitive film was provided in the collodion process.

Now, however, the case is different. A new era in photography has arrived, and we have, in the gelatine process, almost unlimited sensitiveness. We can have plates twenty times, thirty times—or even, according to Captain Abney (than whom no one is better informed)—sixty times as quick as wet collodion plates; and yet we retain, with all their inherent defects, our portrait lenses. No doubt these have been improved to such an extent that many of the defects have been ameliorated. There was a cry for greater depth of focus without diminution of speed. Those who made the cry did not know that what they asked was a physical impossibility; but Mr. Dallmeyer gave them the next best thing to greater depth of focus. This gentleman, persisting that absolute definition was not required in portraiture except for distant standing figures, introduced an ingenious device in his lenses, whereby he defined his focus over a certain depth by causing a certain amount of spherical aberration variable at will.

There are many amateurs who cannot afford such a lens, especially of long focus, even if it were necessary. To these I would point out that they have a power they have probably never dreamed of in any single view lens. I have by me such a lens. It is one of the old-fashioned kind, made by Lerebour. It has a focus of fourteen inches. This I had picked up second-hand, when first I began photography, for, I believe, ten shillings. I thought to try how much I could enlarge the aperture of this lens without destroying definition over a moderately sized plate, such as I would admit for portraiture with a focus of 14 inches.

The original aperture was about $\frac{5}{8}$ in., so that the ratio of focal length to aperture was about 22 to 1. With this aperture the lens covered an 8 by 10 plate easily. I have gradually enlarged the aperture till it is $\frac{1}{12}$ of the focal length, and still I find that I have perfect definition over a whole-plate, and the space is between three and four times that of the lens as it at first was. I enclose you a print from a plate which was taken with this aperture, and I think, sir, you will agree with me that the definition is good enough for any portrait. I find that by using rapid gelatine plates I can take portraits with this lens, in an ordinary room with good large windows, in from forty-three to forty-five seconds. What more could you wish than this? I have a fine portrait lens of the same focal length, but I *actually prefer*, except for children, or in very dull weather, to use the old view lens that I bought for half-a-sovereign, for cabinets, or for heads on a whole plate.

In the angle permissible in portraiture, never more than 25 deg. to 30 deg., the distortion from the use of a single lens will be absolutely unappreciable.—I am sir, yours, &c.,

W. K. Burton.

Proceedings of Societies.

Manchester Photographic Society.

The annual meeting of this Society took place on Thursday, the 14th inst., at the Memorial Hall, Albert Square, Mr. Charles Adin, President, in the chair.

The minutes of the previous meeting were read and confirmed. The following gentlemen were elected members of the Society:—Mr. T. H. Lynde, Mr. J. Mallalieu, Mr. J. Newton, Mr. Joseph Lytle, Mr. W. H. McKellen, and Mr. A. Whitla.

The result of the voting for eighteen officers for the ensuing year was made known, the voting papers having previously been scrutinised at the Council meeting. The result was as follows:—W. J. Chadwick, A. Brothers, W. G. Coote, J. Pollitt,

J. Chadwick, A. Coventry, N. Wright, R. Atherton, J. W. Leigh, J. Schofield, J. Warburton, T. Heywood, C. Adin, James Young, T. Sefton, T. Chilton, George Wardley, John Kershaw. It was arranged that the eighteen new officers should at the next meeting elect their own President, Vice-Presidents, Treasurer, and Honorary Secretary from amongst themselves.

The Treasurer's accounts were read, and a balance sheet passed to each of the members.

Mr. W. J. Chadwick, Hon. Secretary, afterwards made several suggestions on the financial state of the Society, which were recommended to be taken into consideration by the Council, and adopted if possible. Following this was read the Annual Report (which will appear in our next).

Mr. M. Noton, on the subject of "Lenses for Rapid Exposures," said:—"I wish once more to mention my proposal to employ larger lenses for rapid exposures, because there seems to be an idea that a larger lens means a longer focus, and, consequently, a loss of 'the great advantage of the short focus of small lenses.' The fear is groundless, the adjustment of the focus in combined lenses being so easy. Suppose I have two deep meniscus view lenses, each two inches diameter and ten inches focus. By placing these lenses with the concave faces innermost, at distances varying from two to three and one-third inches, I could have a focus of between five and a-half to six inches. Taking six inches as the equivalent focus, a three-quarters-of-an-inch stop placed between the lenses would give $\frac{f}{8}$ with an aperture in the front lens of a little under four circular inches, as catching ground. There is nothing new in combining lenses in this way, and with smaller stops very good pictures may be obtained; but smaller stops require more time and fixed objects. Just the opposite conditions are required when a rapid exposure has to be made, the problem being to get a sufficient quantity of light on the plate in a minimum of time, or there will be no picture."

A paper was then read from the Rev. Canon Beechey on "Instantaneous Shutters—a New One" (see page 513), and a lens with the shutter applied was exhibited.

Mr. J. W. Wade showed a number of very excellent photographs by the gelatino-bromide emulsion process.

Mr. Rishton exhibited a large photograph taken on a Swan's plate. The subject was the interior of a church; and, notwithstanding the exposure was a long one, the chancel window showed no signs of blurring. He (Mr. Rishton) explained that he had adapted a mask cut to the shape of the window and supported in front of the sensitive plate by a little mechanical contrivance by which it could be removed when desired.

Mr. Coote showed an interesting phenomenon displayed in some sensitized albumenised paper. A pad of printed newspapers having been placed for some time at the back of the sensitized paper, it was, when removed, seen that a slight impression of the printed pad was left; and, after exposure of the sensitive paper behind a negative in the usual way, a much more distinct impression of the printed pad was visible on the back. The printed matter was represented in white letters on a black ground, or negative to the printed pad.

Mr. Knott exhibited one of his "injectors" for emulsifying gelatine, and practically demonstrated the action of the apparatus. He also showed several other pieces of apparatus which he used in emulsion work, and promised to read a paper on the preparation of gelatine plates at an early date.

Mr. A. Coventry said he had of late been very much troubled with spots in the preparation of emulsion plates, and, in his case, he believed the evil had resulted from imperfect filtration. He had, therefore, tried a batch of emulsion (which gave innumerable spots when used in the ordinary way) filtered through a wash-leather. The result was that not a spot was to be found.

Mr. J. Schofield showed a standard candle used in photometric tests.

Mr. J. Pollitt promised to read a paper at the next meeting, "On Certain Points of Comparison between Gelatine and Other Processes of the Bromo-Iodide Family."

Bolton Photographic Society.

The October meeting of the above Society was held on Thursday evening, the 7th instant, at the Baths, Bridgeman Street, Mr. Thos. Parkinson in the chair.

As this was the first meeting after the summer vacation, a large number of members were in attendance.

A series of photographs were exhibited by Messrs. Parkinson, Rideout, and Dalton (Hon. Sec.), and others.

Mr. Walter Knowles had also a quantity of instantaneous views taken with an extra-rapid shutter, the action of which was explained to the members.

To Correspondents.

Little Nemo sympathises with Mr. Robinson in respect to his article "Combination or Otherwise," the fifth paragraph of which illustrates a case of his own which occurred only last week; in this instance it was also a question of a second light.

C. E. Wyrall.—We are in receipt of your communication, which shall have our attention. The drawings are rather complicated, and will therefore be expensive to engrave. We will write shortly.

A. C. S.—1. We do not see any red spots on the paper you send us, and cannot judge; we should think, however, the paper is at fault. 2. Sir Humphrey Davy, when he first showed the electric arc at the Royal Institution, employed 4,000 plates, half zinc, half copper, the plates being four inches square. Either dilute sulphuric acid, or salt and water, was probably employed as the exciting liquid; but now-a-days far superior batteries are to be employed, as you will see in any electrical manual. 3. Refer to Brande's Dictionary; it will give you all the information you want.

Wanted, a Word.—Suggestor thinks that the termination *ee* might be found useful in getting at a suitable word, and in the same way as we have already referee, payee, nominee, acceptee, we might have posee, photographee, &c. But Suggestor does not suggest calling his a sitter "settee." Another correspondent J. Zimmerlauf, thinks that exposee, from the Latin *expono*, might be suitable. But then it must be remembered there is a word very much like, that would mean something very much different.

South Devon.—No clouding should occur. If you have employed distilled water for mixing, then your spirit contains resin (is it finish?), which precipitates on mixing with water.

Henri E. Hudson.—Enamelled iron dishes should not be difficult to obtain. Clark and Co., Horselyfields, Wolverhampton, and Langton, 45, Little Britain, E.C., are manufacturers, but the photographic dealers you mention would surely get them for you.

W. H. Deslandes.—You have silver in your bath, and this does the mischief. Follow Payne Jenning's advice (p. 453), and put a little salt in your last washing water before you tone.

Densely.—Your bath is probably too alkaline, or it contains much ether; either cause would be mischievous. If you cannot doctor it satisfactorily; you must make up a fresh one.

J. Kay.—We can't tell you how much liver of sulphur will be required, because it is uncertain how much silver is in your hyposulphite. Make a saturated solution of the sulphur, and add of this until no more precipitate is thrown down. When in doubt, take some of the hyposulphite solution up in a test tube, and add a little sulphur; if no precipitate takes place, you know you have added enough sulphur to the bath.

Gibson.—The best way to remove such stains from fabric is to rub with a solution of iodine (the iodine dissolved in a little iodide of potassium and water), and then to treat with a solution of hyposulphite. But we can hardly recommend you to try this on a coat, except at your own risk.

P. Forrest.—You can rarely get a dense image without ammonia; in fact, a strong solution is often necessary. Do you back your plates? You should do so. Over-exposure and over-development will cause the fading away you speak of. It is possible to prepare the sensitive bromide without gelatine; the difficulty lies in adding the alcoholic collodion. But the problem is worth working at, and should pay the experimenter who first succeeds.

J. Smith.—"Hardwich's Photographic Chemistry" is a very sound treatise; Abney's "Instruction" is also a practical handbook to be recommended. Our Publishers can supply you with the same for 2s. 8½d., post free. You will find many processes relating to photo-mechanical printing in the News from time to time.

G. B. Symonds.—We shall be glad to see sketch in confidence, and give our opinion if you desire it.

H. G.—Marion and Co., 23, Soho Square.

Perplexed.—1. An answer to toning next week. 2. We think it is not the developer, but the plate that is at fault. Back your plates; nearly all plates require it, and some do not give a dense enough image even with this precaution. Surely your developer does not fail with plates of various makers. Try another make of plate.

W. S. Spanton.—Was the negative taken in hot weather? If so, we think the defect may arise from drying. The image is so nice and bright otherwise, that the bath is obviously in good order. We feel sure they are not chemical stains, but must arise from drying or from floating impurities. Negative returned by post.

Thomas Fletcher.—We have received gas jet, and will make experiment with it.

The Photographic News, October 29, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Portraiture in the Exhibition—Gelatine Plates and Studio Work—The Photophone.

Portraiture in the Exhibition.—Despite the quantity of excellent gelatine work on the walls of the Exhibition, we are inclined to think that the result as a whole is somewhat disappointing. Granted that for out-door work the convenience and rapidity of the process place it ahead of collodion, yet the latter in the studio remains unapproached. By far the greater number of gelatine pictures in the Exhibition are landscapes, but charming as many of these are, they do not show to the eye the superiority which one might have been led to anticipate from the wonders which the various manufacturers of gelatine plates have asserted that gelatine was capable of producing. Granted that, when all the circumstances are considered, photographs of express trains, steam-launches, or bathers in the act of diving are very extraordinary; but after the first sensation of surprise has passed away, they excite less admiration than the picture which simply relies on good taste and knowledge of artistic effect. Indeed, the latter will be the more lasting. But with the transient phases of human expression the case is somewhat different. All things being equal, the most artistically-conceived portrait must of course bear away the prize. But where a picture perfect in artistic arrangement, but cold and lifeless in expression, is compared with another not, perhaps, showing so much skill in art, but abounding in the aspect of nature, will the same decision be arrived at? We fancy not. Mechanically the collodion process in the studio is perfect—provided sufficient exposure can be given. But here, of course, is the drawback. In ninety-nine portraits out of a hundred we do not get the true expression, owing to the length of time the model has to sit, and it is only when the hundredth, in which by chance nature itself has been secured, is obtained, that we see the wondrous possibilities of which photography is capable. Now, with the gelatine process, we have by enthusiastic workers been promised all this: but what evidence is there of it in the Exhibition? We are compelled to say very little. Rarely has there been a collection of photographs shown in which pure portraits have formed so small a part. Most photographers will remember the startling effect which Adam Salomon's pictures produced when first exhibited in England. It is not too much to say that these pictures gave an impetus to photographic portraiture for which English photographers have had much reason to be grateful. It must be remembered that the value of a photographic exhibition is not confined to the benefit which one photographer derives from seeing the work which another is doing, but must be considered to include also the knowledge of the capability of the art imparted to the general public. Now, we will engage to say, that not one in half-a-dozen of the non-photographic community will be impressed by specimens whose chief merit depends upon mere rapidity, simply because they do not understand or appreciate the difficulties under which the pictures have been secured. But they *do* understand the representation of true and natural expression in the human countenance; and had any photographer taken advantage of the gelatine process, and devoted himself to this study alone, the exhibition of such specimens would have awakened fresh interest on the part of the public, of which the profession sadly stands in need.

Gelatine Plates and Studio Work.—We should be disposed, in connection with the above remarks, to attribute the absence of studio work in gelatine to the somewhat unfair treatment which the process has received from portrait photographers as a rule. A man shows you a very ordinary-looking photograph, and says, "There, that was taken in a November fog, on a gelatine plate;" or, "The light was so bad it was impossible to use collodion; so I just slipped in a gelatine plate and got a capital picture.' This kind of thing, we believe, represents the only experience which many portraitists have of gelatine, and we would ask whether it is doing justice to a process to use it only when collodion is unworkable? If gelatine plates are so sensitive as they are represented to be, why is it they are not used more when the light is in normal condition, and so give them a fair chance? Of course it may be said that it is only during the past twelve months that gelatine has come into general use, and that much has had to be learnt and unlearnt; but to use it only under the most unfavourable circumstances is scarcely the way to arrive at a knowledge of what it is capable.

The Photophone.—The scientific world of Paris has, during the last few days, been actively discussing the merits of Professor Graham Bell's most recent discovery—the photophone. The principle of the photophone has already been described in the Photographic News, and may be briefly said to be a means of which sounds can be conveyed to a distance of the intervention of a beam of light. In the experiments made in Paris, the light from a Gramme machine and a Duboscq lamp was made to fall upon a small mirror, whence it was reflected into the mouth of a parabolic silvered reflector. In the focus of the reflector was placed a receiver, which really acts as a microphone. In appearance, the receiver is like a small electric coil, about five inches long and nearly two inches in diameter, and is composed of a number of thin discs of tin and mica placed alternately, the whole being pressed together by metal ends, a small tin-rod connecting them. The discs of mica are of less diameter than those of tin, this deficiency of diameter being made up by means of a thin layer of selenium, with which these cavities are filled up. Consequently, it is only through the selenium that the tin plates have any electric communication with each other. To render this current a "quantity" one, all the even discs of tin are connected together, as is likewise the case with the odd ones. A contact screw at each end of the apparatus allows this selenium receiver to be placed in an electric circuit. In the experiments in question a battery of fifteen Leclanché cells was generally used. The ordinary telephonic receivers were placed some forty yards away, several rooms intervening. The small mirror upon which the beam of light is, in the first instance, allowed to fall, is so very thin as to be flexible, and susceptible of alteration of convexity under the influence of the vibrations caused by different sounds. Into the back of the mirror-case is fixed a flexible speaking tube, and by this means these vibratory differences make themselves felt. This mirror, in the present instance, consists of a very thin glass disc, about two inches in diameter, and not more than than 1-200th of an inch in thickness. The surface of this small mirror becomes convex and concave under the effect of the different sound vibrations. These variations in its form act upon the rays of light reflected from its surface, causing them to disperse or to concentrate, so that their intensity, when by means of the parabolic reflector they fall upon the selenium receiver, is always varying. These variations, in direct response to those of the sound vibrations, are transmitted telephonically to the ordinary receivers at the other end, where the sounds are reproduced. The experiments were, so far, successful. Certain sounds and words, especially when containing gutterals, were heard very distinctly. It may be remembered that, some years ago, a prize of 50,000 francs was set aside by the French Government, to be awarded to investigators in electrical science. The first time the prize was awarded was to Ruhmkoff, for his induction coil. The *Commission Ministérielle*, who had the disposal of this prize last year, decided that no one was more worthy of it than Professor Bell; and the advance which the photophone indicates, shows that the prize was worthily disposed. The apparatus was exhibited before the French Academy of Sciences, by the Secretary of the Academy, M. Dumas, and described by M. Antoine Bréguet, as Professor Bell does not speak French. In the course of his

remarks M. Bréguet adverted to the fact that a distinguished French *savant*, M. Charles Cros, who had foreshadowed photography in natural colours, and the phonograph, had also indicated the principle of what Mr. Bell's photophone is to-day the exponent. In a work of M. Cros, printed in 1879, but written in 1871, the author expressed a theory that, by introducing a ray of light into a tube, and interrupting it so as to make the introductions and interruptions correspond to the number of vibrations of which the note given out by the tube consisted, a sound would result. The Academy decided that the passage in M. Cros's book referred to should be printed as a note, and appended to the description of the photophone, which would appear in the next number of the *Comptes Rendus*, but added that it in no way detracted from the merit of Professor Bell's discovery. It is a great compliment to the Professor that the learned assembly before whom the apparatus was exhibited broke through their rule of dignified silence, and warmly applauded the experiment.

"UP IN A BALLOON."

BY W. COBB.

The day was declining, the sun had ceased shining,
'Twas the end of October, bleak, hazy, and chill.

None but an enthusiastic photographer can imagine my feelings when, after being appointed to accompany the veteran aereonaut Mr. Wright, on the occasion of the late International Balloon Contest, for the purpose of taking photographs, I found myself encircled by a heavy chain of adverse circumstances. It seemed as if old Sol had determined upon being more than usually tantalising on this particular occasion, for the approving smile with which he had inspired my confidence during the greater part of the day was, just when most urgently needed, exchanged for a withering frown which certainly had the effect of blighting the hopes he had previously engendered. Besides, the nature of the arrangements were such as to render it somewhat uncertain, until the very last moment had arrived, whether or not I should accompany the expedition. Here was the source of another element of uncertainty, which militated against the success of my part of the day's programme, inasmuch as it precluded the possibility of placing the apparatus in a suitable position prior to the ascent. The representative of the press who accompanied us, evidently read my thoughts aright when he refers, in his report, to the peculiar position I was placed in as a photographer. His remarks, however, were somewhat premature, when he stated that such and such an exposure resulted only in the production of a very indifferent photograph; unless he was gifted with the power of taking a peep into futurity, it is difficult to imagine how he could have arrived at such a conclusion.

Very seldom indeed do I find an advantage in being below the ordinary stature of Englishmen, but for once, and probably only this once in my life, I had no cause to regret it; the fact of my being so much lighter than Mr. A. L. Henderson, of London Bridge, weighed heavily in my favour, otherwise that gentleman would have taken the position I occupied. I may add that it was further hinted that, in case of an emergency, the sudden disposal of such an amount of ballast might lead to results more disastrous than would accrue from the loss of my weight, should occasion arise for treating me as ballast. Thus cheered, I took my place in the car, feeling that, after all, it was by no means an unpleasant duty to serve as deputy ballast. The few moments that remained prior to the start were occupied in preparing for the exposure of the extra rapid gelatine plates which Mr. Henderson had specially prepared for the purpose. An approximate focus of the lens, a French doublet of six inches focus, had already been taken in the grounds of the Palace, and carefully noted on the camera, the latter being provided with six double dark slides for plates five inches squares. The exposing shutter was made by Mr. Collins, of St. John's Wood, on the principle recommended by Colonel Stuart Wortley.

The slide is placed in the camera, the eventful moment comes, and we bounce upwards. What a strange, yet delightful sensation! The effect is indescribable; the earth seems to be receding as the sounds of the ringing cheers die away, and, with their authors, soon become lost in the dim distance. Is it a dream? No, 'tis a charming reality. I am clutching the camera, holding it firmly on the side of the car.

I have already made my first exposure, and, reversing the slide, prepare to renew the attack. All this is the work of a few seconds only.

Mr. Wright, the owner of our balloon—who, by-the-bye, is a professional photographer—having, to use his own phrase, set things square, now comes to my assistance. Says he: "Cobb, my boy, you'll do no good to-day—impossible! Come up with me in the summer time, and you'll be rewarded for all your trouble." Such was his frank opinion, and I shall not forget to jog his memory when the time comes, and sincerely hope that he will not have changed his mind.

We had now attained an elevation of about two thousand feet, and were still rapidly rising, the much-dreaded haze becoming more and more decided. The gyratory movement of the balloon was at times very marked; but this was only noticeable when watching our rival balloon, travelling in the same direction as ourselves, or some other distant object. Seeing that it was quite useless to husband my resources, I exposed the remainder of my plates without further delay.

In all probability the results of this experiment, so far as the photographs are concerned, will not be published, Mr. Henderson's opinion being that the future interests of balloon photography will be much better served by adopting such a course, than by the exhibition of photographs which would be likely to receive adverse criticisms from those who might judge of them as if produced under the most favourable conditions. In this opinion I fully concur. I believe it is the intention, however, to produce some of the plates at the next meeting of the Balloon Society.

It must be borne in mind that space in the car of a balloon is very limited—at least, I found it so in the one attached to the bonnie "Eclipse." Nevertheless, by the exercise of a little ingenuity, ample means could be devised for the successful manipulation of dry plates. Of course an ordinary stand for the camera is quite out of the question. Instead of this I would suggest that the camera be provided with a board somewhat larger and about the same width as its base. Each end should be hinged, and provided with a slot cut lengthways, sufficient space being left in the centre of the board on which to screw the camera. Placing this on the border or top of the car, the hinged parts can be let down, one inside and one outside the car; the two may then be held together in position by means of a long screw. Thus secured it would be impossible for the camera to fall, and it would also provide the means of elevating or depressing it. A finder would doubtless be a valuable, though I scarcely think a necessary, adjunct to the paraphernalia.

By four o'clock we had soared aloft to the tune of some 4,000 feet, and looking over the side of the car I beheld nature under strangely different aspects to what I had ever seen her before. Here was a vast expanse of country stretching out in every direction, presenting a strange appearance of concavity; for a considerable distance beneath us every object was distinctly visible, although of apparently such Lilliputian dimensions, the configuration of each being plainly traceable. The circuitous route of a canal could be followed as far as the eye could reach, and the line of a railway was easily distinguished by the comical looking train, which seemed to be but slowly crawling along through an open country without any apparent obstruction. I was forgetting for a moment the fact that our travelling at a

similar rate produced the effect. We afterwards learned that, leaving Guildford together, we performed the remainder of the distance in about the same space of time, our balloon having the advantage of about five minutes.

It was now getting towards five o'clock; twilight was silently and gradually creeping over us, and a high range of hills loomed in the distance, towards which we were drifting; our friend of the press was quietly engaged taking his notes, and Mr. Wright evidently planning the descent as we were hurriedly driven through cloudland, isolated, as it were, from the world, the clouds themselves enveloping us, and assuming wierd and fantastic shapes. It was indeed a marvellously grand effect which I was contemplating, when a sudden shout from Mr. Wright startled me from the reverie into which I had fallen. "Now, boys, pull yourselves together with a drop of brandy; there will be some work for you directly." Taking stock of our whereabout, we could just see the French balloon slowly descending, but still failed to determine what locality we were in. Instinctively, however, Mr. Wright felt that we were near water—doubtless the sea; consequently a rapid descent was at once decided upon. Receiving our instructions somewhat hastily, and each being provided with a bag of ballast, which we were to drop at a given signal, he emphasised his remarks with "Now, my boys, keep cool, and whatever I tell you to do, *do*." The signal came; down went the ballast, and down went we; it seemed like a race between us which should get to the bottom first. Another shout, "Whatever you do, hold on! Drop into the car. We shall have an awful bump." No uncertain sound was that. The bump was—well, I guess, pretty considerable, and up we bounced again, about thirty or forty feet. "Hold on, steady, lads!" shouted our captain; "another little 'un, and we are safe." It came, and we were safely landed. It was a thrilling spectacle which presented itself on looking over the car. There was the monster lashing to and fro, struggling to free itself from the controlling power of the aeronaut, who, laying his head on his shoulder, naively remarked, "Steady, my darling, steady; you've had your turn—it's mine now. Out you get, Cobb." The next moment I found myself safely deposited on a bed of clover, feeling myself again—a veritable inhabitant of this fair earth, one of dame Nature's molecules, but, ah! how little worth!

FRENCH CORRESPONDENCE.

A Visit to the Author of the Circular—A New Instantaneous Shutter which Measures the Time of Exposure—Photo-Engraving at Messrs. Goupil's—Opening Meeting of the Chambre Syndicale—Photography at the Exhibition of the Union Centrale.

A Visit to the Author of the Circular.—In my last letter, published in the number of the Photographic News for the 22nd October, page 508, I mentioned a circular sent by M. Christian to all the photographers in France, in which he announces the discovery of a method of producing, from any given negative, twelve copies in two minutes without the agency of light. He even offered to perform this feat in the presence of any persons who would like to be present on the occasion. His offer was accepted by a great number of people attracted by curiosity to know what there really was in so extraordinary an invention, and wishing to form an opinion from an inspection at first hand. Several persons were present at this meeting at M. Christian's, when a negative was handed to him, and he was requested to try his skill with it. But, on coming to the scratch, our hero declined to carry out his engagement; he wanted to have first handed to him the sum of 500 francs, which, as he said, he had already demanded and received from many persons ready to adopt his process, and that he had bound himself to show nothing at a less price. Now, it should be observed, that no one had asked him to communicate his process, but only that he should perform his promise with the negative offered to him; he could, if he pleased, have retired into another room, and if then, at the end of five minutes, he had reappeared with a single copy instead of the boasted twelve prints, he would have been held to have redeemed his promise. He limited himself, however, to exhibiting some very ordinary cartes, which, he said, were produced by his method. In fact, I am unable to give any further details of this marvellous process of photographic printing than were contained in my last letter—or, rather, I have reason to believe that there is some trick, and at this I am not surprised. It is true there are certain persons, claiming to be well informed, who assert that there is really something at the bottom of the matter; if this be proved to be so, no one will be more delighted than I shall be; but, in the meanwhile, I may be permitted to reserve my belief until I have something more certain to go on.

A New Instantaneous Shutter.—The inventors of instantaneous shutters are not exactly standing still, and this is easy of comprehension when it is remembered that there must be some uniformity in photographic operations. There is not the slightest use in employing extra rapid plates when the camera is only provided with the old slow moving shutter. Our able colleague, M. Stebbing, following my advice as regards a shutter adapted for exposures of varying duration, has adopted the principle of a spring which can be stretched to any necessary extent, and he thus obtains a movement of the desired degree of rapidity. Based on this principle, he has designed a very ingenious little shutter, the two parts of which are arranged to move in such a way that the play is from the centre to the circumference, and, again, from the circumference to the centre, so that the lens is able to do its work completely. By means of a counterpoise, which can be easily regulated according to the necessary duration of the exposure, the action of the light can be lengthened to any required extent, and by a known quantity. I have seen M. Stebbing's model of this instrument. When it has once been regulated for exposures varying from a small fraction of a second to a second at least, it will enable an operator to measure the time of exposure, and to comply with the conditions given to him. He will no longer find it necessary, as is generally the case at present, either to judge the time of exposure by guess-work, or to always have the same exposure, no matter what are the conditions of the light with which he is working. Soon I hope to be able to give a drawing of this charming invention, which, as I firmly believe, is destined to form a valuable addition to the apparatus of the tourist photographer.

Photo-engraving at Messrs. Goupil's.—With the object of making my readers *au fait* with the present state of photography and its applications in the French capital, I have lately paid visits to all the principal studios. I cannot better commence my task than with an account of the establishment of Messrs. Goupil and Co., at Asnières, so ably managed by M. Rousselon. Going over the works of this first-class firm, I was more especially struck with the improvements introduced by M. Rousselon into his photo-engraving process. Everyone is acquainted with the wonderful productions of this kind published by this house, but it is generally asserted that after the plate issues from the electroplating room, it must be submitted to extensive and costly retouching. This is so generally believed, that I have myself stated the same thing on many occasions. M. Rousselon has now, however, quite undeceived me. He showed me the plates as they were removed from the copper bath, where the metal had been deposited by electrolytic action, without their having been at all touched by the hand of the engraver, and I am bound to confess that, apart from the necessary cleansing, which can hardly be called retouching, impressions could be at once taken from these plates without any further manipulation. The absolute purity of the detail is such that the burin of the most skilful engraver could only have the effect of altering the photographic character of the plate, and thus of completely destroying its value. I will not say that it may not be necessary in certain

cases to heighten the effect by a slight retouching in the deep shadows, and thus to reduce the dullness and monotony of the ground, which may be almost too photographic. This retouching is, however, rather an artistic finish than a necessary part of the work; as M. Rousselon points out, it is quite allowable to combine results which are purely photographic with those which depend on the taste and skill of the artist. In this respect I quite agree with him, and I am convinced that he is only doing what is right in making his plates satisfy the conditions of a higher art, even though he has only, if he chooses, to submit them to a simple cleansing process to render them quite fit for the press. I have reason to believe that the process, although in theory perfectly simple, requires a perfect knowledge of the arts of the photographer and the printer to make it successful. It consists in taking from a gelatine mould, which has been prepared in the same way as in the photo-collotype process, an impression on tin-foil or lead; by the use of some astringent solution a closer grain is obtained on the gelatine, though the nature of the gelatine itself contributes considerably to render this grain well-marked. On closely examining one of the plates there is no indication of any other operation, and I scarcely think it would be necessary to introduce into the gelatine any powdery substance in a state of suspension. It might certainly be done by this means. Mr. Woodbury has shown me some prints of engravings which he obtained by mixing with the gelatine a finely-powdered black, thus producing an image as if in grained carbon, the cast from which possessed all the qualities of an engraved plate. But I repeat this does not appear to be necessary in the case of M. Rousselon's plates. If one of these be touched with the fingers, it is surprising how slight are the depressions and elevations. In fact, if the eyes be closed, it is almost impossible to distinguish between the parts which are engraved and those which are polished. A plate takes from two to three weeks to finish; the copper is deposited at the rate of 18 grammes in the hour. The lowest price of a plate, if less than 500 square centimetres in surface, is 250 francs, and, above that size, the price increases by 50 centimes per square centimetre. These are certainly high prices, but they should be compared with those of hand-made engravings of equal quality. Probably, when the process is more developed, and the products more generally known, the cost of these prints will be reduced. Certainly, by no other photographic process can works be produced of greater beauty and value. As an application of photography, too great importance cannot be attached to this process of *heliogravure*, and everyone must desire to see it more generally extended. What surprises me is that there is not in England a single establishment where works are produced of the same kind as those executed under the direction of M. Rousselon.

First Meeting of the Season of the Chambre Syndicale.—Tuesday, the 19th of October, was the opening day of the session for the *Chambre Syndicale de la Photographie*. The numerously attended meeting, and the animated discussion carried on there, leads to the hope that the season on which we are entering may be fruitful in matters of interest. On the first Friday in November will be held the opening meeting of the Photographic Society of France. As we all know, the meetings of this Society are always productive of important communications and disclosures, and, as usual, I shall not fail to keep my readers *au courant* with its transactions.

The Exhibition of the Union Centrale.—At the present moment an exhibition of metal-work is being held at the Palais de l'Industrie, under the management of the Union Centrale. It contains a photographic section, but there is nothing of importance exhibited there. I noticed some works of MM. Braun and Co., of M. Berthaud, M. Franck de Villecholes, and of some other less well-known photographers. MM. Braun, as usual, are excellent in their carbon prints, in the production of which they stand almost alone in this country. M. Berthaud is the only photographer in Paris who works the collotype process on anything like an important scale. He exhibits a number of beautiful examples of his work, and I propose to revert to his productions when passing successively in review the different branches of the photographic industry carried on in France. LEON VIDAL.

ON THE DECOMPOSITION OF THE SO-CALLED ELEMENTS INTO A FEW SIMPLE FUNDAMENTAL SUBSTANCES.

It has been known for some time that simple relations exist between the spectra of the elements in a natural group, consisting in the homologous relations of the lines of the spectra. Similar relations are also found in the spectra of compounds. For example, cyanogen gives a peculiar spectrum, the more refrangible half of which is comparable to the carbon spectrum, and the less refrangible half to the nitrogen spectrum of the first order, and they are repectively homologous with these spectra; similar relations are observed with carbon monoxide.

As now the spectrum of cyanogen is homologous in one half with the spectrum of carbon, and in the other half with the spectrum of nitrogen, because it contains both these substances, in like manner similar cases might be inferred in the homologous relations of the spectra of certain elements.

Dr. Ciamician, of Vienna, carried this out exhaustively in the Academy of Sciences. He thinks the cause of the homologous relations of the spectra of the elements could be explained by the assumption that the elements are compound, and gives the following surprising explanations.

1. The spectra of the elements carbon, boron, beryllium, and magnesium are perfectly homologous with one another. These four elements consist, therefore, of the same material, which exists in different grades of condensation, which finds expression in the displacement of the homologous lines. The atomic weights of carbon (12) and boron are, in fact, near one another; the atomic weight of magnesium is double that of carbon (24). Cimician calls these groups "Carbonoide."

2. The spectra of silicium and aluminium are homologous with one another, and the more refrangible side corresponds with the spectrum of carbon, the less refrangible with that of oxygen. Silicium consists, therefore, of carbon and oxygen, corresponding to $12 + 16 = 28$ (atomic weight of silicium). Aluminium contains the carbon in the form of boron and oxygen, as its atomic weight $(11 + 16 = 27)$ indicates.

3. The elements of the alkaline earth metals have spectra, the more refrangible part of which corresponds with the spectrum of magnesium, and the less refrangible part with the spectra of the elements of the oxygen series. Therefore calcium, strontium, and barium consist of carbon in the form of magnesium, and oxygen in the condensation forms of sulphur, selenium, and tellurium, corresponding to the atomic weights: $Ca=24+16$, $Si=24+4\cdot16$, $Ba=24+7\cdot16$.

4. The elements of the oxygen group all consist of the same material, which is found in different stages of condensation; which finds expression in the displacement of the homologous lines, and in certain other peculiarities in the formation of the homologous groups of lines in the spectrum. The atomic weights of the elements of the series are: $O=16$, $S=16+1\cdot16$, $Se=16+4\cdot16$, $Te=16+7\cdot16$.

5. The halogens all consist of fluorine and oxygen in different forms of condensation; the atomic weights of the elements of this group—$Cl = 19 + 16$, $Br = 19 + 4\,16$, $I = 19 + 7\cdot16$—express these relations. In this series, as is known, the composition of single members has been conjectured for a considerable time, and they have been thought likewise to consist of fluorine and oxygen.

6. The spectra of the nitrogen group are homologous in the less refrangible part with the nitrogen spectrum, in the more refrangible part with the spectra of the elements of the oxygen group. The elements of the nitrogen group consist accordingly of nitrogen and oxygen in different grades of condensation, which agrees with the atomic weights:—

$N=14$, $P=14+16$, $As=14+4\cdot16$, $Sb=14+7, 16$.

If one relies on this hypothesis, then the remarkable relations of the atomic weights of the elements to one another appear perfectly intelligible. We have then, in the so-called elements of inorganic chemistry, really to do with homologous series, which can quite be compared with the homologous series of organic compounds, which has besides been already conjectured by different authors.

We see, further, that with increasing condensation of the material the metallic character is always more clearly marked; the higher members of a series have always more metallic properties.

It is probable that the present fundamental substance can be collectively referred to the typical elements—hydrogen, carbon, nitrogen, oxygen, and fluorine; it is not, however, implied that these are to be considered as the final components of the material.

A NEW PHOTOTYPE PROCESS.

AT the last meeting in Paris of the Society for the Encouragement of National Industry, a communication was received of a process discovered by M. Lenoir, for producing engraved plates from negatives photographed from nature.

The inventor illustrated his process before the council, preparing plates serving to show different styles of engraving, which were distributed among the audience.

M. Lenoir himself describes his process as follows:—

"Until now, in order to obtain these negatives, a print was made in fatty inks by Poitevin's system. An impression was taken upon a sheet of transfer paper, which was placed upon a metal plate; after submitting it to the action of acid, it was inked several times under water. All this was difficult as well as uncertain. I have sought a means of operating directly upon the plate, without inking, and in this manner I set to work:—

"I lightly coat a metal plate with albumen mixed with bichromate and carmine; this last is used not only as a dye, but it assists in the lifting of the film, on account of its solubility in ammonia. Gamboge and various resins answer the same purpose almost as well.

"The use of carmine is in the stripping off of the mass, because, the exposure taking place upon the upper surface, the carmine draws the albumen with it, more or less, according to exposure.

"When the film is stripped off, an image remains formed of albumen, in itself unable to resist the action of acids. It must, therefore, be rendered insoluble. There are two ways by which this may be effected: one is to cause the albumen to absorb a solution of gum-lac, dissolved in hot water with borax; the other, and that which I prefer, is to plunge the plate, once stripped, in a solution of bichromate of potash, then drying at the heat of about 120 deg. The albumen has by this means acquired the required resistance to the action of acids. The plate has now to be engraved to give it a grain according to the amount of ink it should take up. Upon the unabsorbent and stripped plate a film is spread, consisting of a solution of bitumen of Judea and turpentine mixed with carbonate of lime. When plunged in acid, carbonic acid is liberated; it forms tiny canals through which the acid attacks the metal more or less quickly, by reason of the thickness of the albumen.

"But if strong acid be employed, the minute canals would be soon destroyed; I therefore use acid liquid composed of water acidulated with nitric and oxalic acids and alum. An oxalate of the metal is then formed on the sides of the canals, and causes them to adhere to the plate. The texture of the etching is more or less fine according to the length of time the albumen is allowed to absorb the acid. Minute hillocks remain in form of microscopical obelisks.

"In this state the plate is finished; it requires only to be dried, and is ready to be printed from immediately. No preliminary preparation is necessary, as the whole operation may be conducted in three hours."

AN AQUEOUS VARNISH FOR LICHTDRUCK AND OTHER PRINTS.

BY DR. T. M. EDER.

LICHTDRUCK prints are frequently required to resemble pictures on albumen paper, and to have the same lustre and finish. In order to impart this polished appearance to Lichtdruck prints, different methods can be made use of. A very beautiful lustre is obtained if the prints are first dipped in a gelatine solution, then dried, and treated with an alcoholic varnish. But alcoholic varnishes are not applicable without previous treatment of the prints with gelatine, because they run. Chalk paper takes a beautiful lustre, if it is dipped in a warm solution of shellac in aqueous ammonia. All these varnishes cannot be used for ordinary printing paper, because they penetrate the paper.

A solution of shellac in an aqueous borax solution has been already recommended by Vidal for Lichtdruck prints. A short time ago I obtained a bottle of aqueous varnish from one of the principal German Lichtdruck establishments; this was remarkably good, but the composition was not told us; Herr Herrmann and I analyzed it. I give the following formula for making it, deduced from the analysis, and made up in this way I find it gives excellent results:—

Water	300 parts
Powdered bosax	24 ,,
Dry (calcined) pure soda	4 ,,
Powdered well bleached shellac ...	100 ,,

The latter are dissolved by heating. Gum may be added to heighten the lustre still more, or, if preferred, either ten to twenty parts of dextrine or three to five parts of althea roots. After a short boiling the shellac is dissolved, forming a cloudy yellow liquid, which on cooling is filtered through cottonwool.

Lichtdruck prints on soft paper are allowed to swim for a short time on this aqueous varnish, and then they are hung up to dry. In this manner pictures with a beautiful lustre can be obtained, without being obliged to use the rather expensive chalk paper. Indeed I must remark that the lustre is always more beautiful if the paper is well sized and polished to begin with; rough paper never obtains a high lustre with the aqueous varnish.

The resinous solution turns brown by the application of heat, and even more with the mixture of borax and soda than with borax alone. On that account Dr. Geissler thinks it is more advantageous to prepare the varnish with shellac and borax alone, and in the cold he recommends three parts of a cold saturated solution of borax to be digested, at the ordinary temperature, with one part of freshly-powdered bleached shellac for two or three days under constant agitation, whereby the shellac is dissolved colourless. The varnish acquires a brownish colour even at 50° to 60° C.

Dr. Geissler declares the addition of soda to be superfluous, but, according to all my experiments, it is not superfluous. The mixture of borax and soda dissolves the shellac better than either of the salts by itself. Pure borax solution takes up much less of it, not even half so much. A diluted aqueous varnish can, however, only be used with specially good kinds of paper. With worse paper it goes through and gives very little lustre. Geissler's varnish prepared in the cold is indeed almost quite colourless, and in this relation surpasses that prepared by heat according to my prescription; on the other hand, it gives much less lustre than the latter if the paper has not been very well polished. If my varnish is boiled too short a time or badly filtered, then the paper covered with it feels rough. The liquid should be milky, but not granular. By burnishing, the paper varnished with it gains both in lustre and smoothness, but the polishing is the less necessary the better the varnish has been filtered. The varnish may not only be applied to give lustre to prints, pictures, lithographs, &c., but also with advantage to give finish to linen. If one adds a little of this shellac solution to ordinary starch which is made use of for starching linen, then a very high glaze is obtained, and, besides, the linen is far more proof against wet and dust.

[Our lady readers should note this last sentence.—ED. P. N.]

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AN IMPROVEMENT IN PHOTO-LITHOGRAPHY.

Anyone who practises photo-lithography—or anyone, for that matter, who has to do with the reproduction of maps, plans, and sketches by means of the camera—knows how difficult it is to set up the object true before the lens. Some manage matters by putting the camera upon a table that moves to and fro on a tramway, the lens in this wise being always kept at right angles to the object, which is pinned to a board standing across the railway. In other cases a copying table is used, upon which camera and object are both fixed, the table being turned bodily round to the right or left as may be the more suitable for lighting; this is an admirable arrangement, only it requires plenty of room, aud will not, of course, do when very large drawings or plans are to be copied.

In the arrangement here shown, and for which we are indebted to the *Scientific American*, there remains little to be desired, for it solves at one and the same time two

difficult problems. The camera is always at right angles to the drawing to be copied, and this drawing may be lighted either by turning the whole apparatus (which is fixed on a swivel) to one side or the other, or by elevating or depressing one end of the apparatus, as may seem most desirable. Nay, even if the whole were to move during exposure, the sharpness of the result is not likely to be affected thereby. Plumb-line and spirit-level are no longer required.

The sketch speaks for itself. Both camera and object are upon the same base-board, and the base-board swings on a balance or beam. Even if one end were depressed and the other elevated, the position of the camera would still remain true; while, if the lighting of the studio were uneven, the defect is at once overcome by a simple shifting of the apparatus. For the copying of ordinary photographs, where mathematical precision is of no object, an apparatus constructed after this model would not be without its advantages.

PHOTOGRAPHY OF THE INVISIBLE.

Amidst the many modifications and improvements that have taken place in the gelatine processes, we are apt to forget that, at all events in certain work, collodion is not quite put on the shelf. Among the applications of the latter is one which for the time has been lost sight of, and one which, as an aid to scientific research, no doubt, will have much to say—we allude to the process of photography by means of the invisible rays of the spectrum, which are usually called heat rays. It is now some nine months since Captain Abney gave his Bakerian lecture at the Royal Society on this subject, and, pending its publication in the Transactions of that body, the public have heard but little regarding it, though, as we can testify, the discoverer of the process has not been idle in adapting it to various uses. Amongst other work, we find that Captain Abney has been employing it to find out the *colour* of colourless liquids. For instance, in the ordinary way of thinking, we class water, alcohol, ether, benzine, &c., amongst colourless bodies; but photographs of the spectrum, taken through a foot thick of these bodies, show that in some of these, certain of the invisible heat rays are entirely absent; that is, if the eye were sensitive to these dark rays, ether, for example, would have as definite a colour as a solution of bichromate of potash or any other visibly-coloured liquid. We hope we are not anticipating the publication of the paper when we give, as another example of the utility of the research, that which relates to water, which is shown with a thickness of four feet to cut off nearly every ray which could warm animal structure. Thus, at that depth the only warmth which a fish can get is that due to the absolute warmth of the water, and not to any sunshine which might pass through the body of the water. We have merely given these as examples of what a useful application this method of photographing with these dark rays may be put to. From what we have already learnt of this subject from papers communicated to the Photographic Society and elsewhere, it appears that Captain Abney employs a species of silver bromide which, when viewed by transmitted light, is of a peculiar blue tint, a tint, by the way, which seems to be different to that which is so common in the gelatine processes; and it appears from what we have learnt from him that gelatine is not a hopeful vehicle in which to obtain this peculiar modification of the silver bromide. In the first place, it seems that it is necessary to employ an excess of silver in its preparation, and also a large excess of acid, both of which would appear to be fatal to its formation in gelatine. Again, another remarkable point is that the slightest pressure is able to reduce this blue bromide of silver to a condition of insensitiveness, the pressure of dried gelatine being sufficient to do so. In one experiment Captain Abney transferred the bromide from collodion to gelatine, and prepared plates with it, expecting to find the sensitiveness intact; but the fact of the transfer rendered it slow, and totally insensitive to any rays except those ordinarily useful for photographers. The peculiarity of this especial preparation is that, instead of having one part of maximum sensitiveness to the spectrum, it has two—one in the blue, as is the case with the ordinary preparation of the bromide, and the other just outside and below the red, and it is this part, of course, which enables photographs of the invisible radiations to be impressed.

When Dr. Vogel showed that what is called non-actinic but visible light could be rendered actinic by means of the addition of certian dyes, he made a great step forward in the direction to which we have been referring, and, no doubt, as Captain Abney was good enough to point out to us, if a dye could be found which absolutely absorbed the invisible heat rays, any ordinary emulsion could be used for the same end merely by dyeing the film; but, unfortunately, all the dyes which are impressionable by light—or, as Dr. Vogel calls them, which are optical sensitizers—transmit nearly all of the heat rays, and are not, therefore, affected by them. Be that as it may, the whole of the rays of light, visible and invisible, have been proved capable of impressing a photographic image, and it now remains for photographers to utilize them in the most effective way they can. It is something even now to know that a kettle of boiling mercury can be photographed in an absolutely dark room by the radiations which it emits, and it seems in the bounds of probability that the radiations from a human body may suffice to give an impression on a sensitive plate under similar circumstances.

It is to be hoped that the publication of the Transactions of the Royal Society will not be long delayed, so that everyone interested in this kind of research may have the full benefit of what has already been done.

Notes.

Mr. Cobb, who took part in the International Balloon Contest last week, accompanying Mr. Wright in the English balloon to Havant, gives an interesting account of his journey in another column. Coming from a practical photographer, his remarks are likely to carry weight with our readers. To make room for this account of photography in cloudland, we have been compelled to postpone our "At Home."

We regret to announce the death of Mr. George Hooper, on the 16th inst., at the age of thirty-seven. Mr. Hooper was for some years an energetic member of the Photographic Society, and for a brief period fulfilled the duties of Honorary Secretary.

The simplest way to impart a delicate tint or glaze to cartes-de-visite or cabinets is to add a few drops of aniline dye to some normal collodion, and coat them with it. The mounted photograph is taken in hand like a glass plate, flowed with the tinted collodion, and drained. In a few minutes the picture will have dried, and, according to the consistency of the collodion, will possess more or less finish. If little can be advanced in favour of such treatment, the collodion film has, at any rate, a tendency to preserve the print.

A patent has been taken out in Germany for the purification of spirit by means of nitrate of silver. According to the quality and strength of the spirit, so the amount of silver to be added varies. As a rule, from twenty to twenty-five grammes of nitrate suffice to purify 10,000 litres of spirit. The nitrate of silver is dissolved in ten times its weight of water, added to the raw spirit, and the whole is then re-distilled. The process at once takes from the spirit any unpleasant smell it may possess.

Many of our readers have seen the fine examples of ceramic photography exhibited at Pall Mall by the Autotype Company. It is said that there is likely to be some demand for pictures of this kind for gravestones, monuments, and the like.

Photographs are now-a-days to be found in almost every cemetery; and abroad, mementoes of this kind are in some districts very rife. In the pastoral valley of Sarnen, in Switzerland, where the snow-hooded giants of the Oberland overlook green meadow and silvery lake, we have seen several churchyards in which the pictures of the deceased appeared above most of the recent graves.

Major Gordon tells us that in Brittany, whither he is going out for a day's fishing, or a day's photography, his equipment is to all appearances the same. He finds his trout-basket a handy and convenient receptacle for camera and plates, while his tripod in its case is apparently a fishing rod, and nothing else.

"Vous allez à la pêche, Monsieur," is the salutation that greets him, and as he often chooses river-side scenery, the observation is all the more natural. "An angler on the bank sometimes glares at me under the impression I am going to pop my line in beside his, and is considerably relieved when he finds out what my basket really does contain." On his return after a good day's work, having exposed, perhaps, a dozen plates, Major Gordon is quite ready to nod affirmatively to the bon villageois, who salutes Monsieur, and hopes that the "pêche" has been "bonne."

A correspondent, in writing to us sharply about the Exhibition, thinks his pictures should have had far more notice than they received, and believes that the Hanging Committee meant personally to slight him. But he remembers how Mrs. Cameron's pictures were treated, and that affords him consolation.

We are able to assure our correspondent that the hangers in question, in the fulfilment of their thankless task, had but one object before them—that of getting through their work as quickly and conscientiously as they could. The comparison of his work with that of Mrs. Cameron we can assure him does not hold good, except, perhaps, in the way in which Mr. Buggins Brown, the poet, was once compared to Shakespeare; said the critic: "The name of Buggins Brown will be remembered when Shakespeare is forgotten—but not till then."

Professor Henry Draper, of New York, writes: "During the night of September 30 I succeeded in photographing the bright part of the nebula in Orion in the vicinity of the trapezium. The photographs show the mottled appearance of this region distinctly. I intend shortly to publish a detailed description of the negatives. They were taken by the aid of a triple objective of eleven inches aperture, made by Alvan Clark and Sons, and corrected especially for the photographic rays. The equatorial stand and driving-clock I constructed myself. The exposure was fifty minutes."

M. Nadar, of Paris, has sent us a portrait in which some white satin drapery—its glossy folds and translucent sheen—is reproduced with exquisite charm and delicacy. It is evidently the work of a gelatine plate; and here we would once more urgently call our readers' attention to the suitability of gelatino-bromide in the treatment of what Mr. Whistler would term a "symphony in white." The gelatine plate lends itself especially to the rendering of delicate shades or *nuances* in white drapery, &c.

Speaking on the subject of photographs of white satin, it is not generally known that the old act drop at Drury Lane theatre was painted from such pictures. The scenic artist to whom the order was given to produce a curtain of shining satin, caused to be taken, to help him in his work, a series of photographs showing the various aspects of satin after being folded in different ways; for everyone knows that the glossy material when creased never looks twice alike. The lines and the reflecting surfaces are for ever changing according to the angle of the material. The photographs, however, soon supplied the artist with the varying phases needful to his purpose, and it was in this way that the satin drop of Drury Lane—for many years the admiration of all London—was designed and painted

A FOURTH VISIT TO THE EXHIBITION.

MR. GEORGE NESBITT has six bold studies. Of these (188), "Returning Home" cannot fail to be the most admired. A tall, statuesque damsel, with a basket deftly poised upon her head, is crossing a brook; her sweet face, her clear eyes, and, above all, her rounded arm and dainty fingers are simply charming. But man, unfortunately, is never satisfied! What a pity—for, with all her charms, the tall, supple model is just the least bit flat-footed—the girl was not wading through the brook at the time her picture was secured! In his other pictures, Mr. Nesbitt has not been quite so fortunate with his models, but the series represents considerable artistic feeling and much earnest work; indeed, we very much doubt if any other exhibitor has worked so hard and conscientiously as Mr. Nesbitt in his endeavours to make a good exhibition.

Mr. Adam Diston's clever sketches are well known. His pictures all have a story, and generally an interesting one. "Winter" (190) is expressed as plainly in the back of the boy, huddled up in his jacket, as in the nip of whiskey, of which the old lady is availing herself to keep out the cold. Mr. Diston, in another picture, has endeavoured to solve a problem that Rejlander ofttimes troubled over,* and has done it, perhaps, as well as it can be done—a little maid endeavouring to snip a ray of sunshine in twain with her scissors.

Mr. W. S. Debenham shows a rapid picture of boys blowing soap-bubbles (214), taken, we are told, in one-eighth of a second. Mr. A. Bisset Thom sends three contributions, of which the most taking is "Jumbo and Scott (247), the monster elephant at the Zoo, with his castle on his back. Mr. H. Garrett Cocking has four studies, all well done, of which we prefer "Reflections" (237), a lady dressing before her toilet glass, the details of which are treated with singular taste and skill. Mr. E. Brightman is represented by three exhibits: "Lost" (229), a boy alone on the sands, whose face hardly seems to realize the situation; no one can believe he is "lost," especially as, in another picture, "Youthful Art" (285), we find the same young urchin figuring away contentedly on a rock with a bit of chalk. The third is a frame of little landscapes, of which the one in the middle—a tiny shadowed pool, where water-lilies grow—is the best. Messrs. Boning and Small (225) show some excellent work in the shape of cabinet and panel portraits. Messrs. McLanachan exhibit a series of portraits and a series of views; and Mr. W. B. Wilkinson sends an instantaneous view of "Hull Market and Market Place."

Mr. Joseph Paget (241, &c.) sends several examples of rushing trains secured at full speed—taken, of course, upon gelatine plates. Captain Turton (265, 266, 267) contributes several frames of summer sketches and animal studies, many of them worthy of attention; some of the sketches are indeed very well chosen. Messrs. C. and J. Jones (268, 281) send some wonderful pictures of the Thames, above and below bridge; the clever studies suffer a little, however, from the contrast between the black vessels and the white foam in some cases. Mr. H. A. Daniel, the energetic Secretary of the Bristol Photographic Society, has found time to forward a series of Sylvan sketches (270), of which the "Mill-dam" is the most pleasing. Mr. Ernest Soutter (271) exhibits some exceptionally good landscapes. "Richmond Park" is delightful, and "Kingston" has all the softness and clearness of a fine engraving. Mr. H. H. Harding contributes a frame of Cabinet portraits (272), which contains some good work. Of Mr. Stokoe's two exhibits, "Choice Bits from St. Osyth" (341) is the more successful; but the heavy foliage among the dark ruins is scarcely sufficiently lighted. The same fault detracts from Mr. James C. Cou's clever "Cattle Subjects" (279), which would have been far more effective if not quite so dark. The Hon. Mrs. Holden Hambrough shows a frame of views (289), among which there are two charming sketches of "Furness Abbey," one of the most picturesque ruins in old England. Messrs. Marion and Co. exhibit a miscellaneous collection, which includes some fine American work, notably cabinet portraits and transpareucies by Sarony of New York. Mr. W. P. Marsh exhibits a series of portraits of children (301), some of which denote exceptionally good photography.

Mr. F. Holyer (304) exhibits a charming reproduction of a painting by Burne Jones, its soft harmonious rendering being still further enhanced by tasteful printing in Platinotype. In platinotype also we find another fine example of an interior by Mr. H. Manfield (309), to whose works we have already referred; this, "The Marble Hall, Galton Park," with its shining marble floor and decorated walls, is simply a masterpiece of photography. Mr. Ernest H. Goold (315, 316, 317) shows three pictures, that of "Burnham Beeches" being particularly good. Dr. Huggins, F.R.S., who has for some time past adopted platinotype for printing (321-323), forwards several studies and views executed with much taste; a lake view with trees on the margin of the clear water has all the delicacy of a tiny water-colour sketch. Mr. F. A. Bridge, who also prints in platinum, exhibits a miscellaneous collection (324), one of them, a "Flower Study," demonstrating in a high degree the delicacy of tone and tint that may be secured by this process. Mr. Cobb's fine portrait of "Mr. Gladstone" (320) is exhibited by Messrs. Marion, enlarged and printed in permanent pigments; in "Watching for Pa" (347) Mr. Cobb is not so happy in pose and models as he usually is.

Some views of English scenery by Mr. Trenemen (339) will secure attention, especially that of St. Colomb Porth, which embraces a bold bit of rocky coast. "A Misty Morning" (343), by Mr. J. Dudley Radcliffe, an elm tree

* "There was one picture—in his mind's eye—that Rejlander tried often, but unsuccessfully, to realize with his camera. One day, when he lived in the busy town of Wolverhampton, he had need of a pair of scissors to trim a print, and despatched a girl for them. She was a long time gone, and at last Rejlander, impatient of waiting, went out into the court that ran beside the house to look for her. It was a dark, grimy thoroughfare, surrounded by sooty chimnies and brick walls, but a bright ray of sunshine had somehow managed to stray into the place, and when the master looked out he saw his little messenger with the scissors in her hand, standing on tiptoe, endeavouring to snip the ray in two. Rejlander used to say that the production of a picture like this was out of the domain of photography."

beside a placid river, with the distant foliage veiled by mist, constitutes a pleasing little picture. Some portraits in Rembrandt style by Mr. W. McLeish (344) are distinguished for boldness and softness, as also for considerable taste. Mr. L. W. Hilder (348) shows some woodland scenes, with sunshine effects, difficult studies enough to execute, and which have been handled with much skill. The studies of Mr. A Stewart (349—352) exhibit skill in manipulation and careful execution ; a fault, however, is a certain set character that some of the models show. Mr. John Nesbitt's (355-356) pictures, a "nutting" or "blackberrying" party of children in the wood, betoken skill in the rendering of a difficult subject ; the figures are perhaps a little too insignificant for a group, and would have been all the better if depicted larger and bolder.

A series of pictures of "Old London," the work of Mr. H. Dixon (357 and table) supply an interesting application of photography ; they are produced under the auspices of a Society for collecting relics of the metropolis, and the most recently taken, those of Charterhouse, are quite equal, if not superior, to the earlier portion of the series. To the circumstance that old bits of London are usually to be found only in crowded thoroughfares and densely populated rookeries must be attributed, we suppose, certain defects in lighting and perspective that now and then make themselves visible in the series. Mr. J. Galloway exhibits a series of views (361) clear, bright, and artistic, printed on tinted paper ; and Mr. T. G. Hemery shows "Swinging on Gate" (364), a production more or less photographic. Mr. J. Werge contributes an interesting feature to the Exhibition in the shape of some Daguerreotypes, one representing a portrait of Madame Daguerre, and another an instantaneous view, taken from the New York landing stage in 1853, demonstrating clearly enough that so-called instantaneous photography is, at any rate, more than a quarter of a century old (362, 363). A frame of "Memoirs of John Bunyan" (365), the work of Messrs. Tuohy and Co., is replete with interest, the most successful of the little pictures being that of Moot Hall, Elstow. A soft, subdued tone pervades the series, and the only question is whether a little more brightness would not have added to the value of some of the prints.

On the table are two balloon photographs by Mr. W. H. Le Fevre, supposed to depict the River Seine and the Bois de Boulogne ; they remind one more, however, of Albert Smith's "Strasburg by Night," there is such an absence of detail. It is a pity they are exhibited ; balloon photographs are not novel. We have had in our possession for the past fifteen years a very good bird's-eye-view of Boston, U.S., taken from a balloon; while the pictures of M. Nadar, of Paris, as every visitor to the last Paris Exhibition might have seen, are magnificent panoramas. Mr. W. B. Bolton shows an interesting bit of photographic history—Dr. Maddox's original gelatine negative, dated 1871. On the table, too, are some magnificent examples of shipping (382), shown by Mr. C. Sands; one of them, a sail—a dark mass of shadow on the glittering sea, entering Boulogne harbour—is a delightful work, and cannot be sufficiently commended. One of the lower pictures would have been quite as successful if the whole of the vessel had been in the field of the lens, but the exposure was made too soon, a fault that could scarcely have happened if the camera had been fitted with a "finder." M. Gustave Re shows a series of forty phototypes, or prints in fatty ink; and Herr Carl Metzner, of Cottbus, has an album of studies of prize cattle, and a series of landscapes which include some very good work. Messrs. Murray and Heath send a revolving stereoscope and slides.

The apparatus exhibited include Warnerke's patent actinometer and sensitometer ; Hughes' triple lantern ; Werge's non-actinic developing tray ; Sands' portable non-actinic lamp ; Werge's table tent ; Marion's changing box ; and Cadett's instantaneous view shutter.

Topics of the Day.

MY INFANT STUDIES—ANOTHER NEW SHUTTER.

BY T. G. WHAITE.

At the soirée of the Photographic Society, on the opening of the Exhibition, I had several times the question put to me, "How did you manage your little studies in the bed-room?" and "What shutter did you use?" Perhaps a short article in the News may be of some service to a number of enthusiastic amateurs I know, who anxiously scan the pages of the Photographic News weekly. First of all, let me disclaim anything new in the matter, excepting the baby and the shutter : the former now speaks for herself ; the latter I will anon describe.

The pictures originated in a desire to produce studies in which white draperies and flesh would predominate, and under such lighting as we at home are accustomed to see the subjects. Those who will carefully examine the pictures, and recall to mind, or compare them with, undraped studies taken in an ordinary glass-house, will at once be struck with the greater suitability of the ordinary chamber and single light for producing much more truthful pictures, better modelling, and, if properly timed, less risk of solarization or chalkiness.

For those who make their own emulsion, it may be as well if I describe how I made this particular batch from which these plates were made. It was composed of three different "cookings" ; the first, of about 8 ounces, was cooked six days (at that time I used the long cooking method ; I have since abandoned this for the shorter one—it was too tedious). This batch, I found, upon coating a plate and testing, to be over-cooked and foggy. I then added about five ounces, cooked five days, with slightly better results ; upon the addition of six ounces more, cooked four days, I found the plates extremely rapid, and requiring great care on developing, shielding from the direct light of ruby lamp, small dose of ammonia, and plenty of restrainer.

I would not venture to estimate the exposure ; it no longer gives any idea to say it was instantaneous. I know twenty years ago we used to advertise "instantaneous portraits of children," and, if we succeeded in obtaining an under-exposed negative in about five seconds, that would build up with mercury, we imagined the contract had been carried out.

Those who have seen the studies in the Exhibition will judge from the attitudes and the expressions that the exposures must have been some portion of a second only.

The room in which they were taken has only one window, and that not a high or a large one. The bed on which the children were romping was rather nearer the window than the centre of the room ; the glass I had previously stippled over with a piece of glazier's putty. I do not find this prolongs the exposure if recently done, but relieves you of the fancied necessity of a reflector, which invariably gives you something you would gladly get rid of afterwards, especially if the eyes be turned towards it ; if the putty be allowed to remain on some weeks, the exposures are much prolonged, either on account of its becoming yellow, or retaining dust, smoke, &c.

There was no other preparation—no other interference with the ordinary light—therefore I think we may assume they were lighted *au naturel*.

Eight exposures were made before developing any, and before eight o'clock in the morning ; the four upright pictures exhibited with two figures each, and four of landscape shape with four figures each ; seven were good, the eighth having portions of the figures off the plate—the children being all at one end of the bed, as I did not focus for each. I always endeavour, when taking these kind of pictures, to avoid focussing more than once ; you are sure to be tantalized by seeing a good picture on the ground glass, and the reverse on the negative ; children will not stand fire this way. I focus on a given spot, get my plate in camera, amuse

them up to this spot, carefully keeping myself out of range, and expose unknown to them. It is quite useless to attempt such subjects if you go about it as per studio rule—posing, focussing, inserting plate, then requesting them to be still and look happy. What do they look like? If well trained and obedient they will grin, certainly, if promised a reward; if shown a toy, or something amusing, they stare and look like having their portraits taken; but no real life—no naturalness; they can't do it to order under such a series of inflictions.

The lens was a common French quarter-plate I bought, twenty-two years ago, for a few shillings, with a fixed stop where we now place the Waterhouse diaphragms; it was never intended for cabinet pictures, but covers fairly. I do not *prefer* such a lens, but it is the only lens I keep at home for testing emulsion.

The shutter is one of my own construction and make, and is a rude affair, but which I think worthy of a better manufacturer. It is simply a small balance made out of a child's toy-box of "scales and weights." One brass pan is attached with a little gutta-percha to one end of the beam, like an inverted saucer—at the other a thin disc of brass is fastened perpendicularly in front of the lens, having a slit capable of being enlarged or decreased. The whole is enclosed in a cardboard box on end of lens, with a feeding-bottle tube attached *under* the inverted saucer. A slight puff through the tube, or from an india-rubber bulb, tilts the balance, and exposes the plate—the size of aperture and force of air employed deciding the length of exposure. The whole cost of the affair was threepence, the toy (an old bon-bon box), and a piece of tubing. It has done duty many months, with an occasional gluing, and will, perhaps, many more, unless some enterprising optician adopts it. In that case, I shall be happy to become his first customer.

It has several advantages over any I have yet seen: it is extremely light—no small matter to the tourist; there is no "jar"; being so lightly balanced, the least puff of air through the tube brings it over the lens, and is then held down by a small piece of matchwood suspended over the disc that falls into a slot, and shakes the camera no more than a good-sized "bluebottle" would in alighting on the lens.

I showed it a few days since to a very eminent photographer who has bought nearly every rapid shutter offered to him; and, after carefully examining it for some time, he exclaimed, seriously, "Well I'll be hanged!" He has not yet, however, submitted to the operation.

The "Topic" for next week will be "On the Action of Light upon Bromide of Silver: A Test for Decomposition of Gelatine," by J. Vincent Elsden, B.Sc. (Lond.), F.C.S.

Correspondence.

AN EXPERIMENT WITH GREEN WALL PAPER.

Dear Sir,—I wish to describe to you a very pleasing experiment that I have tried during the past summer.

I had a transparency taken from a negative of a shady lane (foliage and sky). In the transparency the sky was clear and the foliage very dense. I also found a piece of green wall-paper about the size of my hand. I placed the two in a printing-frame, and exposed to the sun for a long time (several days). On removal from the frame I found the sky nearly white, and the foliage plainly marked on the wall-paper. It would have made a fair picture, only the wall-paper had two or three different shades of green in it, and small brown lines about it. It was most perfect where the dark shades were. Possibly some of your readers could tell me of a dark green colour that would fade rapidly. I have but little time to spare for photography, but think that the above might be made to give pleasing results.

I am sorry to say I left the specimen print lying about in a little shed I use, and so lost it.

If I had the opportuntiy I would try that green-faced paper I have seen hand-bills printed on.—I remain, dear sir, yours truly, C. J. Emery.

SPOTS (NON-ACTINIC) ON GELATINE NEGATIVES.

Dear Sir,—Will you kindly allow me, through the medium of your columns, to enquire whether any of your readers have had a like experience to myself in respect to the above? The particulars are as follows.

Having taken a quarter negative of a child, and from which a limited number of prints were required, it was not varnished. All went well until about eighteen prints were struck off, when on looking at the next print it was covered in white spots, and presented the appearance of a snow storm; the spots are of a yellowish-brown, perfectly non-actinic.

Now it transpires that an enlargement is required, and a considerable number of prints, and the negative, to all appearances, is ruined. Can any of your readers suggest a remedy for the spots? Perhaps someone has had the same experience, and can assist—Yours faithfully, T. W. H.

[As the negative was not varnished, contact with the silver paper is quite enough to account for the spots.—Ed. P.N.]

OXALATE AS AN INTENSIFIER.

Sir,—I am glad to see a verification of my letter in your journal of October 9, on "oxalate as an intensifier," by such an experimentalist as Mr. H. L. T. Haakman. If he realizes his idea of fixing the plate first, and developing afterwards, in daylight, it will be a new era in dry-plate photography. I would state a few further facts—as I have tried several plates (since my letter in your columns was published) with uniform success. I have chiefly used old oxalate developer, mixed for weeks, and either in daylight or the dark-room. Fresh oxalate worked very quickly. My first experiment was on a plate of Bennett's which I had put by as useless, being nearly a positive, after trying mercury and ammonia. This I dropped into the developing dish, in the old oxalate, and left it a few minutes, then washed well and placed it in mercury, when it rapidly whitened. I then washed, and placed it in the ammonia, getting a good printing negative, with details in shadows before invisible, and the light intensified to printing density.

I enclose a print for your inspection. It is of no value except to prove my statement as to the power of the oxalate to make a positive into a printing negative. I have tried the same experiment with other plates besides Bennett's—Nelson and others—with the same results as to intensity, both as negatives and transparencies. Mr. Haakman's trials quite confirm all of mine, and I must have tried eight or ten plates, at least. I believe the same method will answer with collodio-bromide emulsion, from a trial or two I have made on some of the Liverpool emulsion I have had by me for five years, and which was quite good when I tried it a few weeks since.

I hope that Mr. Haakman and other experimentalists will continue their trials of oxalate for this purpose, and especially as regards the fixing and after development of negatives, and report the result in your columns.—

Francis W. Turton.

THE PRICE OF GELATINE PLATES.

Dear Sir,—As a beginner with gelatine dry plates, may I be allowed to make a few comments? I consider the dry plates much too high priced for general use. I admit the great advantages; at the same time, if you happen to make many transfers, they come very expensive. You are well aware we can coat and develop a half-plate picture by the wet

process, not costing us over 1½d., glass and all, and therefore I cannot see why these plates should cost 6s. per doz. the half-plates, without the carriage. I hope the time is not far distant that we shall be enabled to make our own emulsion, and coat our own plates as we require them, using them either wet or dry, without much difficulty, and that the bath will be a thing of the past when we can purchase these plates at (say) half-plates 2s. 6d. per doz.; and I do think before two years we shall be able to purchase these plates at the price named; then gelatine is bound to come into general use. It is all very well for those West End houses that can command their one guinea per dozen cartes, but in the country our prices only average 10s. per dozen—a vast difference. The fact is, bye-and-bye, in steps the foreigner into the market, as with the albumen paper, and down comes the price.—Yours, &c., FREE TRADE.

COLLODION *VERSUS* GELATINE.

DEAR SIR,—The writer of your last "In and Out of the Studio" has mentioned my name in connection with the rapidity of gelatine plates, and has come to the conclusion that no plates are more than ten times as rapid as a wet plate. In most cases where silver bromide is used such a comparison means nothing, but, as I recently pointed out in your columns, with plates containing that treacherous (!) and hurtful (!) iodide, the comparison is much more exact. Now, the plates that I took abroad *were* fifteen to twenty times more rapid than wet plates. They were tested against the latter in every possible way—with Warnerke's sensitometer, and in the camera—and such is the result.

Well, there are wet plates—and wet plates; and with due respect to the writer of the article, his wet plates must have been more than ordinarily rapid for him to have obtained a fully-exposed negative in twenty seconds of the same kind of view with the same stop and lens that I used, whereas my plates in two seconds were slightly under-exposed in the foreground. Two years ago, when I took the wet process with me, I found that the same kind of views (*i.e.*, semi-distant mountains and a *foreground* of dark pines) required close on a minute's exposure, with one size larger stop (*i.e.*, No. 3), and that forty seconds was too short. This I have from my notes. As to the light, as far as I can recollect, it was about the same, and my tour was made in the same time of year.

If the foreground (excuse the Irishism) was middle distance, I can understand the short exposure; but when you are on the side of a hill surrounded with pines, and taking a view through a break in the wood, such a short exposure would be totally insufficient with *my* wet process. It is very satisfactory to hear that the writer has succeeded with the process I described, and that he gets such excellent rapidity with it. Rapid as he gets them now, I think I may be able to show him how that rapidity can be doubled or trebled, if he is present at the meetings of the Photographic Society, unless he may have used the same modification himself which I then hope to describe.—Yours faithfully, W. DE W. ABNEY.

PS.—I may mention that plates containing iodide have now kept between exposure and development for six months and more, without the slightest loss of detail in the images; in fact, they develop as well as if freshly exposed.

TECHNICAL EXHIBITION.

SIR,—Will you allow me to remind your readers of the Annual Technical Meeting of the South London Photographic Society, which will be held on Thursday next, November 4th, at 7.30 p.m., in the large room of the Society of Arts, Adelphi? The Committee will be pleased to see as many members and friends present as possible.

If any of your readers have anything new or interesting that they would like to exhibit at the meeting, I shall feel obliged if they will kindly let me know some time before, so that a programme of exhibits may be prepared for the chairman.—Yours truly, H. GARRETT COCKING, Sec.

Proceedings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

Annual Report.

IT is matter for special and general congratulation that your Council have the pleasure to lay before you this report on the twenty-fifth anniversary of the inauguration of your Society. To say that we have met and kept together for a quarter of a century is, beyond doubt, proof positive that there has been a oneness of feeling and general harmony amongst us as a body; and it must be gratifying to remember that we rank second only to one such other society in Great Britain in point of precedence. We allude to the Photographic Society of Great Britain, which dates its existence two years anterior to our own.

Reverting to the past year's proceedings, we have to state that our numerical strength has improved in proportion to thirteen new members against seven resignations, making a total of seventy-three members.

None can doubt that the meetings of the past session have been of a sufficiently attractive character to induce a considerable increase in the attendance of members, when we state that the average has been thirty-eight against twenty-nine and a-half of the previous year. However much we may regret the scarcity of papers, there is, nevertheless, a decided indication that a very considerable improvement has taken place in this respect, as the number of papers read during the past season has been greater than in any previous one during the life of the Society, and we think this in itself should prove an incentive to such members as have not hitherto given expression to their ideas in that form, and we are exceedingly hopeful for a still more fruitful result in the immediate future.

We have now the pleasure of enumerating the various communications that have been made, and other attractive features about our gatherings during the past twelve months. Ten papers have been read on the following subjects:—

"An Exposing Valve," by Mr. M. Noton; "Holiday Photography," by Mr. C. Pearson; "Artistic Photography," by Mr. George Gregory; "Photo-electo Metallurgy," by Mr. Wm. Watts; "Photographic Copyright," by Mr. A. Brothers, F.R.A.S.; "The Platinotype Printing Process," by Mr. James Young; "Coating Plates with Gelatine Emulsion," by Mr. M. Noton; "Practical Experiences with Gelatine Dry Plates," by Mr. George Gregory; "The Gelatine Process," by Mr. T. Chilton; "Exposure of Dry Plates," by Mr. J. W. Swan.

Reverting to the photographs exhibited, both as negatives and prints, those by the gelatino-bromide emulsion process have been the more numerous, and amongst the exhibitors may be mentioned Mr. Coote, Mr. Coventry, Mr. W. J. Chadwick, Mr. George Gregory, Mr. J. W. Leigh, Mr. T. Parkinson, Mr. Sefton, and Mr. J. W. Wade, and some very interesting specimens from Messrs. Mawson and Swan; also, a fine collection of prints from the Platinotype Company. Instantaneous shutters have been shown by Mr. Coventry, Mr. Chilton, and Mr. M. Noton.

Various new non-actinic lamps have been exhibited, amongst which were those of Mr. Brooks, Mr. W. B. Wood, and Mr. Coventry. Mr. Watts exhibited several lockets, *specially designed* for photographs.

You are indebted to Mr. Parkinson for the presentation of a carbon enlargement from a very interesting negative taken by aid of the electric light.

The magic lantern has been brought into use by Mr. Brooks, Mr. W. J. Chadwick, and also by Mr. W. Watts, who interested the members by projecting on the screen the action of electro-deposition.

A new tourist's camera has been exhibited by Mr. Chapman, a photo-chromoscope by Mr. York, a stereoscope by Mr. H. Grubb, and many other minor matters too numerous to record here.

With regard to our outdoor meetings, we deeply regret that it has not *yet* fallen to our lot to be as successful in these as some other societies are; and although the weather has been very favourable, generally speaking, we hope that during another year we may look for encouragement and help from other sources apart from the weather, as we must try to make the desire to promote them more universal amongst us.

Talk in the Studio.

Technical Exhibition at the South London Society.—The annual Technical Exhibition will be held on Thursday evening, the 4th prox., in the large room of the Society of Arts, Adelphi. Particulars may be had from the Secretary, Mr H. Garrett Cocking, 26, The Parade, High Road, Lee. The annual dinner of the Society takes place on Saturday, November the 6th, at 6 p.m., at the Cafe Royal, Regent Street.

Christmas Cards.—Mr. E. A. Maxwell, of Barnet, sends us some charming little Christmas cards, which certainly do "show how photographers can employ their spare time during the winter." The prints, says Mr. Maxwell, are from old negatives of various sizes. They are mounted on cabinet cards, in the centre being a tasteful vignette. One is a leafy avenue, another a summer-pool with water-lilies, the third, a peep under the trees, with ferns, &c. Upon the margin of the albumenized paper is then tastefully printed a frame-work or wreath of real flowers or hollyberries from another negative, the whole making a very effective picture. Messrs. Newnham, of Bournemouth, send some cards of a similar kind, but vignetted portraits, and they also forward us several wax paper negatives for printing in the fancy margins, "Happy New Year," "Merry Christmas," &c., after the vignettes have been produced. These paper negatives will be very convenient for turning ordinary prints into Christmas cards.

Presentation to a Photographer.—A silver salver was presented to Mr. Fall, of Baker Street, by his employés, on the 19th inst., on the occasion of a dinner given to commemorate the reorganization and extension of that gentleman's establishment.

Messrs. Sarony and Co.—The tenth annual supper of the employés took place at the Talbot Hotel on Friday, the 22nd inst., the chair being occupied by Mr. Newman (artist), and the vice-chair by Mr. Rudd (principal operator for fourteen years). Very complimentary allusions were made by the various speakers to the business tact displayed by Mrs. Sarony, and the speeches generally testified to the hearty cordiality subsisting among all on the establishment. Among the visitors were Dr. Rooke, Councillor Crosby, Messrs. Briggs, Timmerman, &c. Toasts, and vocal and instrumental music formed part of a very interesting programme.

The Electric Light.—Last week Mr. J. W. Swan lectured before the Newcastle Literary and Philosophical Institution on electric lighting. He showed that for lighting purposes electricity could be stored, divided, and measured like gas, and produced much cheaper. He exhibited a lamp which he had invented, and explained his process, by which a town and all the houses in it could be lighted from one common centre. The room was lighted by several of his lamps, the electricity being produced at his works, a quarter of a mile away. Sir William Armstrong congratulated Mr. Swan on his success.

Engraving on Glass.—We have received from Mr. J. Sabatier a little gutta-percha bottle, containing "A new fluid for writing on glass." The "new fluid" is, evidently, hydrofluoric acid. But, if not novel, it would, no doubt, be very economical, for photographers frequently wish to write upon, or mark, glass-plates; and if they could only get the fluid in small quantities, ready and fit for use, would, probably, be glad to have such a useful agent by them.

Phosphorescence.—Radziszewszi, in Liebig's *Annalen*, gives a careful study of the conditions under which various carbon compounds exhibit phosphorescence; he concludes that this phenomenon occurs with those compounds which combine, in presence of alkalies, with the active oxygen of ozone or other peroxide. Phosphorescence he regards as a special case of the phenomenon of combustion; during slow oxidation active oxygen is produced; hence it is in such processes of oxidation that phosphorescence is noticed. When oxidation is rapid, much of the active modification of oxygen is produced, combination occurs rapidly between this and the oxidising substance, and we have the phenomenon of combustion. The phosphorescence of certain organized creatures is due, according to the author, to the slow oxidation, by the agency of active oxygen, of such compounds as lecithin, cholesterin, spermaceti, myricylic alcohol, sugar, fats, or ethereal oils. He shows that these substances are decomposed by cholin and neurin, and generally by bases of the formula $R_4\,N\,OH$ (where R is a monovalent alcoholic radicle, *e.g.*, CH_3 C_6H_5 &c.), and that this decomposition is attended with phosphorescence.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

*** Erratum.—In Mr. Burton's letter last week, "from 43 to 45 seconds," should read 3 to 5 seconds.

John Harman.—Received; they shall have our careful attention.

Perplexed.—The ordinary run of albumenised paper will not tone satisfactorily beyond the warm stage; the toning bath recommended for dark violet tones should be mixed two or three hours before use, being compounded of:

Chloride of gold	1 grain
Chloride of calcium	8 grains

Tommy.—Then do not do so.

neutralised with lime water. Your negative received; it has plenty of detail, but, as you say, lacks density. Under the circumstances, the only obvious explanation can be want of energy in the developer; application for a quarter of an hour should give a very dense film. Add a little more iron, and use when quite fresh.

J. T.—Last week's News will tell you. Also see "At Home" at Scotland Yard, some six months ago.

Poor Photo.—It is a question of "Poor Editor" this time, we think. The question about converting dipping bath into printing bath we answered Sept 17. In respect to shutter, yours is as good as any we have seen for medium exposures; any of the apparatus makers who advertise would make you one, but our advice is "to bide a wee;" you will then have several to choose from. Mr. Bedford's formula, published as a Topic a few months ago, is a very good one. Never mind about refunding cost of carriage.

A Gleaner.—Your work is decidedly good, if it cannot be ranked in the first class. The posing is generally a little too full-faced. A little more brilliancy and lighting up all over would be an improvement, but mind you do not lose vigour, which is very satisfactory in your pictures. A little more light judiciously employed would be an advantage.

Enquirer.—The burnishing of a large surface is a difficult matter, and would probably be expensive. Write to any large dealer, and state size, but get an estimate first, as it may not be worth your while. In regard to the second question, we think Solomon, of Red Lion Square, would be the most likely house to supply you.

Luminous Paint.—Messrs. Ihlee and Horne, 31, Aldermanbury, are the agents.

B.—Our Printers call it Great Primer Latin.

Inquirer.—We should think about seven or eight years.

R.—Myrrh will dissolve very well in spirit 60 O. P.; effect a solution in this way first, and then add your collodion.

Brighton.—You have added too much; one drop to the ounce of collodion is ample.

Alice.—A rubber finger-stall may be used with impunity. A strip of glass is handy to lift the paper.

A. A.—In June last.

Photo-Chemist.—He has been dead some years; most of his negatives, we fear, are lost.

Robert Haigh.—The Year-Book of Photography for 1879 (from our Publishers by post 1s. 2d.) contains a practical article on Ferrotypes.

A. B. T.—No benefit, but the tone is a little darker and clearer.

G. T.—Employ a matt varnish, and the difficulty will be overcome.

Bon Voyage.—Put them into small parcels, and then you should have no difficulty in passing them. State frankly what you have, and we do not think they will make any difficulty. Belfort is now the last station in France, but you have to pass through a bit of Germany before you get to Basle.

J. Brightman.—It is better to fix a second time.

R. T.—The spots are due to imperfect varnishing, so far as we can make out from the small piece you send. We have found collodion answer the purpose, but varnish may give you better protection.

Margaret.—Oxalate does not stain the hands like pyrogallic; some photographers prefer one, and some the other.

Gelatine.—Why not send back the whole batch? The maker would much prefer changing the plates, than be the subject of grumbling. It is probably the packing that is at fault.

W. L.—Only a publisher.

B. B.—Not always; in the case of No. 2, for instance. Printing is done by many photographers; see our advertisment columns.

W. B.—Thanks; we will give the subject attention.

Photo.—The letter and photograph were duly posted.

A Beginner.—Robinson's "Pictorial Effect in Photography," issued by our Publishers, will give you all the information you desire.

M. T. B undoubtedly.

The Photographic News, November 5, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

PHOTOGRAPHING BY ARTIFICIAL LIGHT—PHOSPHORESCENCE AND FLUORESCENCE—ACTINOMETERS.

Photographing by Artificial Light.—During the dismal weather we have had for nearly two months, the thoughts of most photographers must have turned to the question of the possibility of a ready and economical means of producing photographs by artificial light. There are hosts of methods, it is true, from the electric light down to the "secret" by which, for the small sum of twenty-four stamps, the inventor will divulge the process and guarantee its perfect success. The Luxograph light is being worked commercially, and so is ordinary gas, as effectually demonstrated by Mr. Laws. Still the mass of photographers know very little about the powers of artificial lights, though it is within the experience of everyone that something of the kind would be an inestimable boon and "put money in the purse." The success which has attended the technical meetings of the South London Photographic Society suggests that an evening might be profitably spent in the demonstration of the possibility of using artificial light in an ordinary photographic business. A few weeks ago we gave a description of Mr. J. W. Swan's electric lamp, and since then Mr. Swan has delivered a most interesting lecture on the subject. In the description which we gave of Mr. Swan's lamp, the illuminating material was incandescent carbon. Carbon, however, has always had the drawback of a too-ready combustibility, and therefore experimenters have always sought to substitute some other substance. We notice that Mr. Swan in his lecture stated that he now uses a better material than carbonised cardboard. An advance has distinctly been made, as Mr. Swan, with his usual deliberate care, can be relied upon as one who would not make a statement publicly unless he were prepared to verify it. London photographers, we are certain, are anxious to know something practically of Mr. Swan's electric lamp, and certainly if artificial light is needed anywhere, it is needed in the most smoky city in the world. If it be not possible to have a "technical" meeting of the kind we have suggested above, could not Mr. Swan be persuaded to deliver his lecture before the Photographic Society? The interest felt in the subject is intense, and we can safely prophecy a crowded attendance.

Phosphorescence and Fluorescence.—The phenomena of the fluorescence and phosphorescence of certain substances, such as Balmain's paint, are not clearly understood, but recent experiments would go to show that, while few substances phosphoresce— that is to say, retain and emit the light imparted to them—nearly every substance is capable of fluorescing, though the rays given forth may be so faint as to be practically invisible. Mr. Lewis Wright, in a series of interesting letters which have appeared in a scientific contemporary, draws attention to this point, and goes on to say that phosphorescence, as shown by Balmain's paint, ought to be clearly linked with fluoresence, a coincidence which was felt to be necessary by Becquerel, who constructed a "phosphoscope," by which the illuminated fluorescent substance can be rapidly removed from the light; he thus found they retained luminosity for a calculable time. Mr. Wright further alludes to Professor Tyndall's experiments on the subject, and describes an apparatus by which fluorescence and phosphorescence were clearly demonstrated to be united. This apparatus consisted of a square iron lantern, which had on one side a perpendicular slit reaching from the bottom almost to the top of the lantern. Outside the slit was mounted, on axles, a cylinder driven by a grooved pulley and stout cords forming a double system of multiplying wheels, so as to give swift rotation. This cylinder was painted with uranium the salts of which fluoresce green, and made to revolve rapidly, the light coming through the slit being supplied by the electric light, though, as Mr. Wright points out, the magnesium light would do nearly as well. It is obvious that a person standing on what, for the sake of explanation, may be called the reverse side of the revolving cylinder, would, supposing it were not phosphorescent, find it perfectly dark, simply because it would act as a screen in cutting off the light coming through the slit. This, however, is not the case. The cylinder, under these circumstances, becomes perfectly luminous, giving forth the characteristic green light. Thus, as the writer of the letters remarks, fluorescence is linked on to phosphorescence, and though all fluorescent substances will not show this, with our present experimental means there can be little doubt that it is only a question of degree and of powers of observation. The subject is certainly a very fascinating one, and is well worthy of investigation. By the way, what has become of Balmain's paint? The experiments made were wonderfully successful, but has any real practical use been made of it? The experience of any one who has put it to practical use would be worth hearing.

Actinometers.—A valuable hint to those who use actinometers is conveyed in the experiments of Macé and Nicati, who, a few months ago, indicated to the French Academy a method of comparing lights of different colours as to intensity. From a series of experiments they have now come to the following conclusions :—1. In all cases, the maximum intensity in the solar spectrum is in the yellow—very near line D (as generally accepted). The intensity decreases very quickly on either side of this point. 2. The perception of blue and violet diminishes much more slowly, with diminished illumination, than that of less refrangible colours. Also, from the extreme red to the green of wave length about 0·5 inches, the law of distribution of intensity remains absolutely the same, whatever the illumination (green being merely observational). 3. Between eyes equally capable of discerning colours there are very sensible differences. The last proposition is the one to which we would draw attention. In the use of all actinometers dependent upon gradations of tint or varying intensity of light, the differences which exist in the human eye must always be borne in mind. Of course, if an accurate scale be set up in the first instance, by experiment, these differences are not of much importance. But it is evident that no experience of one person can be said to represent that of another, and hence the necessity of personal calculation when using actinometers.

At Home.

AT SARONY SQUARE, SCARBOROUGH.

A JOURNEY of nearly 500 miles, undertaken for the sole purpose of visiting a studio, is no little matter, even in these days of fast through trains and comfortable carriages; but we may say at the outset that a peep at the Sarony establishment at Scarborough is well worth a few hours' hard travelling. In any case, we fear it would be hopeless to enlist the sympathies of the reader in our behalf; for, after all, a couple of days spent at the queen of watering-places during warm autumn weather, just as the outbursts of sunshine are getting few and far between, and it behoves one to make the most of them, can scarcely be termed a grave hardship. We shall say nothing, therefore, of our swift journey down north, of a two hours' halt at York for dinner, and a peep at the Minster; its massive roof so clearly lit that every trait and niche in the white stone is plainly visible, and its magnificent windows—especially "The Five Sisters of York," endeared to us by Dickens' charming legend—which are among the finest in the world. Nor shall we enlarge on our first glance at Scarborough, as we looked down upon it at night, from the high cliffs, and saw below the glittering lights of the Spa Gardens, the curved quay studded with lanterns, the illuminated bridge and grand hotel opposite and far away at the

further sweep of the bay, the outline of castle and hill dimly visible in the twilight. These and other matters we must be silent about, if we do not wish the reader's sympathy to turn into absolute envy.

Imagine a well-built square of white houses in a fashionable part of the town. The garden of the square is protected with handsome railings; there are green shrubs and trees in the vicinity of the railings, and, for the rest, a well-kept lawn decked with flower-beds, and intersected with brown gravel walks. In the centre of this garden is the Sarony establishment. It is a solid, oblong building, Grecian in style, and, at a rough guess, 120 feet long. The building is white, with cream-coloured corner stones, and a broad flight of steps at either end of the building form a fitting entrance. We go in by the eastern door—the threshold guarded by a pair of lions rampant—the aspect of the interior being more that of a public establishment than a private one; indeed, as we soon discover, the Sarony Gallery is one of the sights of Scarborough. Visitors may come and go any hour between nine and five; and beyond the many productions of a photographic nature on view, there is, on the first floor, a fine collection of paintings, for the most part the work of F. Jones Barker, the painter, it may be remembered, of "The Allied Generals before Sebastopol," a well-known picture that has been engraved and extensively sold by Messrs. Graves, of Pall Mall. "The Charge of the Light Brigade," by Mr. Barker, now occupies a post of honour in the Sarony Gallery, and there are other noteworthy paintings and portraits which make the fine hall a point of attraction and fashionable lounge with the visitors to this favoured spa.

But we have, as yet, got no further than the corridor. On the right hand is the business department, where a specimen of every form of portrait may be seen. Here we are met by Mrs. Sarony, who is good enough to give us a hearty welcome, and by Mr. Fisher, one of the managers, in whose company we are to make a round of the premises. Mr. Fisher tells us that the Promenade or Panel portrait has taken very firm root at Scarborough, being the favourite picture of the season; and while in the business department we may mention that the charge made for promenade portraits is one guinea for five plain portraits, or four vignetted and enamelled; for in the Sarony establishment enamelled pictures are still in favour, and sitters readily pay a larger sum for the extra finish imparted by a glaze of gelatine and collodion. Cartes-de-visite are charged six for half-a-guinea, or twenty for a guinea.

We walk along the corridor. On the right, as we proceed, are the reception and waiting rooms. These are magnificent. Handsomely furnished, more after the style of a French salon than an English drawing room, the apartments are the embodiments of good taste and costly elegance. Rich divans and velvet lounges, lofty mirrors and gilded tables, attract the eye on all sides; pictures are on every wall, and one of the salons contains a collection of most exquisite water-colours. Two studios lead out of these reception rooms on the ground floor, and here most of the portraits are taken, for, although there are other glass rooms above, the sitter is not troubled to ascend, unless it is absolutely necessary.

We go through the door of one of the salons and enter the studios. They are both lighted from the north. In the middle, where they join, the cameras are placed, and the dark rooms are situated. Thus two sitters, taken at the same time, supposing there were no division between the studios, would be facing one another. In this way, husband and wife can be secured from different aspects, while yet lighted from the north, and an assistant can operate indifferently in one studio or the other without altering the conditions of his working. The studios strike one as very different to those usually met with. They are small, low-roofed, sombre, and cool; and as we look at them, we call to mind the predilection for low studios that has of late years manifested itself, among Berlin photographers especially. In a word, the Sarony studios are the very opposite to what glass rooms usually are. The rooms are painted a French grey, which looks the darker by reason of the absence of height. On the light side, the curtains are drawn from the end of the studio up to a line with the sitter; then comes an area of six or eight feet square of plain glass, usually covered with a gauze, while, in the rest of the studio, in front of the sitter, the light is exceedingly subdued. At the camera end of the studio it is indeed, comparatively gloomy, so that assistants may enter the dark rooms which adjoin (and which serve for both studios) without inconvenience to themselves or the operations they may be conducting. There is provision for top-light, but little use is made of it, the illumination here being kept under control by a sort of Venetian blind arrangement placed horizontally—or nearly so—upon the roof.

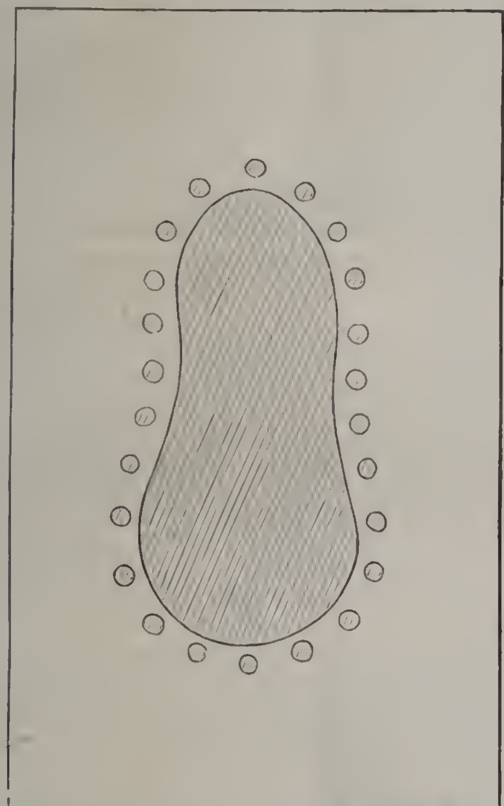
At first sight there is apparently not much room for backgrounds—they are all Seavey's—in these small studios; but on looking nearer, we find ample provision has been made in this respect. The backgrounds are ingeniously contrived to rise from below, and so well balanced are they, that with one hand you can change the scene without difficulty. The accessories in use are very few, and none, we were glad to see, had that highly-polished, glacé aspect, which is so much in favour with many makers of these articles.

Wet collodion is still in every-day use; "it is the difficulty in developing rapidly, and being sure of your result before the sitter leaves," that has stood so far in the way of gelatine for ordinary work. The assistant, too, cannot be made to forget old experiences. "I really think the only way will be to train an assistant for dry-plate work alone, if we want to work it smoothly and regularly," said Mr. Fisher.

At the entrance we remarked a huge tabular statement of all the rooms in the building, and these we now proceed to visit. In the corridors, on the staircases, and in many of the rooms, the window panes are photographic transparencies, not only of subjects direct from nature, but of paintings, prints, &c., whose appearance is exceedingly attractive. Here, on this floor, is a series of artists' rooms; here is an apartment with rows upon rows of opals in a more or less finished condition; here are the retouching rooms; here enlargements on canvas. At the Sarony establishment all enlargements on canvas are made in silver, and, on expressing a desire to see the process in operation, we are forthwith ushered up to the second floor. "The great thing in the preparation of the canvas is to wash with plenty of water," said our guide; "but, of course, it is necessary to remove to the last degree any pigment or preparation that may have previously been applied." As we enter, a canvas is in process of sensitizing. It is resting upon a board, its four corners fixed up with clips, so as to form a tray; it has previously been treated with equal parts of bromide and iodide by way of "salting," and it is now under the action of a thirty-grain solution of nitrate of silver. In its position upon the board the canvas may be handled at will, and presently the bath is poured off, and the fabric, wet as it is, stretched for printing. A Monckhoven enlarging apparatus, sunshine being employed as the illuminating agent, projects a magnified image upon the canvas, and in two minutes the latter is ready for development. It is taken down, placed once more upon the board, the corners clipped as before, and a developer containing equal parts of citric acid and pyrogallic acid poured over. The development is complete in about five minutes, and then a solution of salt and water is poured on; the fixing may be at once proceeded with, or may be postponed almost indefinitely, as may seem best.

We now proceed to the basement, where are the workshops, the negative rooms, the enamelling and printing rooms. Two little points in the printing-room, scarcely very novel, perhaps, are still worth noting. To secure faultless prints from a cracked negative, it is put at the bottom of a narrow box, two feet deep, with blackened

sides; a sheet of tissue paper is then dropped upon the face of the printing-frame, and the box carried out of doors, where, obviously, only parallel rays can reach the plate. This method, according to Mr. Fisher, is the simplest way of treating cracked negatives, and that it is a perfectly efficient one, we can testify. The other point is the method of vignetting adopted. A very great deal of vignette printing is done, and a quick and effective plan is, therefore, very necessary. It would never do to issue a faulty vignette bearing the name of Sarony. The printing in the summer is all done under frosted glass, and in these circumstances very delicate tones are obtained. The vignette masks are made in a very ready manner; a piece of thin cardboard, the size of the printing-frame, has cut out of it a pear-shaped opening the size of the bust or figure, and round the circumference, or margin, of the opening are punched holes, all of the same size, exactly as shown in our cut (see fig.). If one



part of the picture requires to be printed a little more, a few extra holes are here punched in the cardboard. This is then fixed upon the top of the printing-frame, being about half an inch above the negative; and so diffused is the light that passes the mask, and so well is this contrived, that the most delicate gradation is produced without the printer being at the trouble of once moving the frames during printing. With a punch at hand, a vignette mask of this kind is fashioned in a few seconds.

A very highly albumenized paper is employed at the Sarony establishment, and, in reply to a question on our part as to the occurrence of blisters, these, the chief printer told us, were generally found to be due to the employment of too strong a silver solution. The defects usually disappeared on weakening the bath. The washing of the prints is conducted in circular troughs with a siphon arrangement.

The "At Home" for next week will be "On Scarborough Sands."

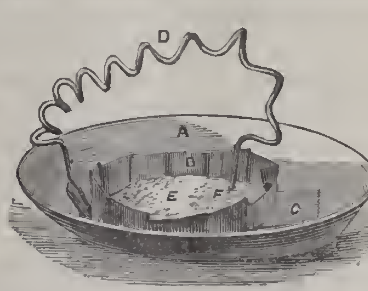
REDUCTION OF OLD SILVER BATHS BY ELECTRICITY.

BY H. STONE.

For reducing old negatives and printing baths there is perhaps no process easier or better than that of precipitating the silver in the metallic form by means of the electric current, and as the method I am about to describe will require no more apparatus that are usually found in most photographic laboratories, it may be of some use to some of my fellow photographers.

Suppose you have got twenty ounces of old bath solution, pour it into a tall glass jar (a sweet-bottle will do very well, and may be purchased of any grocer for about twopence), and dilute it with an equal quantity of water; add hydrochloric acid till all the silver is thrown down in the form of chloride, which is to be collected by filtering it; the chloride being to a certain extent insoluble, and left on the filtering paper. You will now require a porous cell, made in the following manner: take a piece of white blotting-paper about eight inches in diameter, and place it on the top of a jar or any other cylindrical article about two inches less in diameter than the paper, and smooth it down as if you were going to make a cover; when you have got it to set properly, take it off, and your cell is finished. A piece of clean zinc plate seven inches long by four inches broad, with a copper wire soldered to one end, and a saucer are now required. Place the zinc plate in the saucer, and on the plate put the paper cell. The silver chloride in the wet state must now be put in the paper cell, and the wire from the plate bent over the porous cell, and the end scraped clean and placed in the chloride. Pour diluted hydrochloric acid in the space between the saucer and paper cell, so as to half fill the saucer. It is then set aside for a few hours, when the chloride will be reduced to the metallic state in the form of a course grey powder, and must be washed to free it from hydrochloric acid and zinc chloride. Perhaps the best plan to wash small quantities is to place the precipitated silver in a tumbler and pour water over it, and after letting the silver settle, decanting the clear solution, repeating the operation two or three times. When it is washed enough, pour off as much of the water as possible, and add nitric acid, taking care to add only just enough to dissolve the precipitate, which it will easily do without the application of heat. If the silver nitrate be wanted for the printing bath it will not require to be crystallized if care has been taken in adding the nitric acid, and may at once be brought to the proper working standard by adding distilled water till the argentometer stands at 50. But for the negative bath, it is best to test it with blue litmus paper, and, if it reddens it, to drive off the acid by the aid of heat.

The following photograph of the working apparatus will



perhaps make the process clear. A, is the saucer; B, paper cell; C, zinc plate with copper wire, D, attached; E, silver chloride, the dark portion marked F being the chloride reduced.

MILITARY PHOTOGRAPHY.*

Photography possesses great advantages in cases when as accurate a reproduction as possible of any object is required. During the last fifteen years such great improvements have been introduced into the applications of photography to lithographic and typographic printing as to render the multiplication of copies of photographic pictures extremely economical and rapid. These considerations have induced the Governments of many countries to establish institutions and schools in which operations in the various branches of photography are extensively carried on, and the *employés* receive at the same time instruction in photographic manipulation. As might be expected from the multifarious applications of which photography is susceptible, sometimes one, and sometimes another branch of the public service in these different countries, according as the special wants were more urgently experienced, has been the first to avail itself of the advantages presented by photographic operations; but, as a rule, we find the military departments have most rapidly come to the front in this respect.

In Great Britain the Ordnance Survey Office at Southampton, which is under the War Department, introduced into their workshops more than twenty years ago photozincography, the invention of Col. Sir Henry James. The results obtained by this process were so important, that very soon afterwards the Governments of France, Belgium, the Netherlands, and the United States followed the example. The photographic branch of the institution has served as a model and pattern for nearly all other similar organisations. Here special maps for military and other purposes are copied and multiplied, as well as objects of special national interest, such as rare manuscipts. Photographers from the Survey Office are often attached to military and civil expeditions to take photographs abroad.

While the institution at Southampton is chiefly occupied with the reproduction of maps, plans, and other works of the same kind, the General Photographic Establishment, a branch of the Chemical Department of the War Office at Woolwich, under the direction of Mr. Baden Pritchard, is charged with much more extended duties. Here are taken photographs of the trials of the various kinds of ordnance, and their effects on iron plates of different thicknesses, objects which are made for experimental purposes, cannon and small arms of all descriptions, armour plates, military waggons, rockets, even the flight of a cannon shot, are reproduced by photography. In the latter case, not only the path of the shot through the air, but also, by means of an electro-magnetic shutter, the rapidity of its flight, is photographically determined.† Of very great importance have proved to be the photographs taken at this establishment for instructional purposes. From these it can be seen how the different kinds of cannon are to be brought into action, where the gunners are to stand at the various words of command, how articles of uniform are to be worn, how harness is to be mounted on the horses, how saddles are to be borne, waggons to be loaded, tents to be set up. Photographs of this description are annually produced by thousands, and are sent out for the use of the instructors in the different regiments and branches of the service. In the production of prints the carbon process is almost exclusively used, so as to secure absolutely permanent pictures. Recently the Woolwich photographers have engaged in balloon photography for reconnoitering purposes with an apparatus invented by Mr. W. B. Woodbury.‡

To meet the wants of the military and naval services so far as regards actual photography in the field, a photographic school was founded some six years ago in connection with the Royal Engineer Establishment at Chatham, under the direction of Captain W. de W. Abney, R.E.§ The photographers trained there, mostly non-commissioned officers of the Royal Engineers, are attached when on active service to the Quarter-Master General's Department; their duty is to copy plans and sketches, and to take photographs of any views of interest. For the production of large prints at Chatham, collotype is employed; for the reproduction of maps in the field, papyrotype. The photographic equipment on active service consists of a waggon with a dark chamber containing four cameras, ten lenses, and materials sufficent for a three weeks' campaign; a dark tent and three dozen dry plates are also attached. The waggon is harnessed with two horses, or with four horses in the field; it is manned by five photographers, an officer, and four Sappers. The field waggon for papyrotype and typography contains materials for three months; it is manned by two Sappers and a non-commissioned officer. All these waggons are attached to the field telegraph, so that the general in command has at his disposal a well-instructed body of men. For mountain work a special photographic equipment has been designed, weighing three hundredweight, and drawn by three mules.

All the pupils in the School of Seamanship at the Royal Naval College at Greenwich receive instruction in photography. Naval officers are all required to have a knowledge of it, and every ship in the Royal Navy has on board an officer who is provided with the necessary apparatus.*

At Calcutta there is an extensive photographic establishment attached to the Surveyor-General's office, Park Street, under the direction of Major Waterhouse. Here, both collotype and photo-lithography are worked with remarkably good results.

In Austria, the Imperial Royal Institute of Military Geography, at Vienna, is charged with the photographic reproduction of maps by means of the photo-lithographic and heliographic processes, both of which have been there brought to a great pitch of perfection. The department of this establishment which is devoted to the general work of copying and reproduction is divided into six sections:—(1). Photography with the process of printing in silver. (2). Photo-lithography with the carbon process. (3). Heliography with a special division for electro-plating and retouching. (4). Copper-plate engraving. (5). Lithography. (6). The printing-presses, connected with which is a small workshop for the repair of machinery, as also carpenters' and bookbinding shops. The whole department is under the direction of a captain, and four technical assistants, and the number of *employés* altogether amounts to 222.

Between the years 1872 and 1879 there were produced in this establishment 12,507 negatives on glass, 43,233 silver prints, 6,821 carbon prints, 2,822 photo-lithographic transfers, 1,443 heliographic plates, and a grand total of 10,316,910 impressions by hand and machinery presses. By the heliographic process there were produced 190 sheets of the general maps of Central Europe to a scale of 1 : 300,000; 319 sheets of the new special map to a scale of 1 : 75,000; and 72 military route maps to a scale of 1 : 300,000. Under ordinary circumstances, in times of peace, four to six steam presses on the Angerer system are kept at work six hours a day, and during the season of the summer and autumn manœuvres, when the demand for maps is greater, they work ten hours a day. A full description of the processes worked in this Institution will be found in a *brochure*, by Captain C. Volkmer, entitled "*Die Technik der Reproduction von Militärkarten und Plänen des K. K. Militärgeographischen Instituts zu Wien*," published at Vienna, in 1880.

The photographic *atelier* of the Bavarian General Staff, under the direction of Capt. E. Albert, employs for the production of maps by preference the collotype process, and obtains by this means the best results.

In Berlin, a military photographic department has been for several years connected with the Ministry of War. The maps required for the campaign of 1870-1871 were

* *Photographisches Archiv.*

† This description is rather high-flown, we fear.—Ed. P. N.

‡ Mr. Baden Pritchard designed the balloon apparatus referred to.

§ This institution is now conducted by Lieut. Darwin, R.E.

* This may be literally the fact, but not officially.—Ed. P. N.

mostly produced in the photographic laboratories of Krupp's Steelworks at Essen.

The Dutch Ministry of War at the Hague has possessed since 1860, its own military photographic department, conducted by the engineer officer, Van der Beeck. In this department the reproduction of maps, plans, and drawings is effected by means of photo-lithography, and representations of the equipments for the Artillery and other war material are produced in considerable number. The reduction of the military and typographical survey maps of Holland would, by the ordinary methods, have required a period of thirty-one months, while by the help of photography it was completed in less than four months. The Government of the Netherlands has also directed photographs to be taken of the various military positions in their colonies, and the views taken under these circumstances of different mountainous and fortified posts in Java and their other possessions in the East Indies are among the most interesting works in this field of military photography.

Several extensive institutions for military photography have been established in France. The General Staff has for nearly twenty years possessed a fully organised photographic service for the preparation and reduction of maps and plans. At Versailles the Artillery has a well-arranged photographic laboratory in which, under the direction of Capt. M. A. Jouart, photography is employed for military survey by means of Chevallier's photographic plane table; also for the observation of the trajectory of projectiles with the aid of an apparatus invented by Capt. Florentin. (*Application de la Photographie aux Leves Militaires Paris*, 1866.)

The Belgian General Staff employs the photographic methods on a large scale. The *Service de la Photographie au Dépôt de la Guerre de Belgique* at Brussels, which is under the direction of Capt. A. Hanuot, facilitates the study of military surveying for the officers of the army by means of views, &c., taken by photography, photo-lithography, photo-zincography, and colour printing.

In Sweden, photography and photo-lithography form a branch of the Lithographic Institute, belonging to the General Staff at Stockholm; it is under the direction of Capt. A. von Bortzell.

The photographic reproduction of maps and plans is entrusted in Russia to the department for the preparation of State papers; the photographic division is directed by George Scamoni, and produces excellent work in heliography for copper-plate printing. Russia has rendered special service not only to military science, but also to the development of geographical and ethnographical knowledge, by the production of photographic views of hitherto unexplored regions of Central Asia. The photographic division of the Imperial Russian General Staff is under the direction of the Government Secretary, Von Nisowsky, at St. Petersburgh; that of the Staff of the army of the Caucasus is under Capt. Von Kontrakensko at Tiflis.

In the year 1872 a photographic section was formed for the Ordnance Survey in Portugal, and this has, since then, been developed into a general photographic service for the Portuguese Government. The workshops and laboratories of this department are located in what was formerly a Jesuit convent in Lisbon, the conversion of which to its present purposes cost the sum of 133,000 francs; they occupy 46 different buildings, affording altogether a space of 700 square metres. Apparatus and machinery cost a further 66,000 francs, but in this is excluded the cost of the non-photographic machines, steam engines, lithographic machine presses, etching apparatus, caoutchouc reduction machines, electric light engines, &c. The large expense entailed by the conversion of the building is due to the old convents not being well adapted for a photographic establishment; a totally new building would scarcely have cost more in erection. For instance, the laying of the gas and water pipes, and of the drain pipes for the residues (by which alone several hundred grammes of silver are economised in the course of the year) must have been exceedingly expensive, as they had to be taken through solid walls of great thickness. Both the wet and the dry collodion processes are employed in the establishment; also the silver printing and the blue tracing processes, photo-lithography, photo-zincography, phototypography, photographic copper-plate printing, and the asphalt process. These processes are all described in the little work—*La Section Photographique de la Direction Générale des Travaux Géographiques de Portugal.* In the division of this establishment, which is under the direction of Prof. J. J. Rodrigues, twenty-four persons are employed.

Photography is very extensively employed for military purposes in the United States of North America. The United States Naval Depôt has been very successful in taking photographs of the effects of torpedo explosions; photography is also resorted to in the coast survey.

Reviews.

Stereoscopic Transparencies. By John Harmer, of Wick, near Arundel.

Mr. Harmer sends us half-a-dozen stereoscopic transparencies representing English scenery. Since the days of Breese we have seen no more charming productions, and those of Mr. Harmer may, in this respect, be compared with advantage to the Breese pictures, that they appear to have more colour. It is very strange that photographers in this country have permitted the foreigner almost exclusively to monopolise this branch of photography, and we warmly welcome a recuit in the ranks in the person of Mr. Harman.

The moonlight transparencies (which, by the way, are never very satisfactory) are the least pleasing of the series. The slides are clear, bright, and delicate, and we unhesitatingly say that the renowned Paris house has never produced a better picture than Swanscombe Park. The soft, grassy slopes, that reach to the water's edge, overshadowed here and there with stately trees; the forget-me-nots and lilies in the placid pool; the swan, its bright, snowy plumage lit up in the sunshine; the translucent cloud mirrowed in the lake, make up together a most delightful picture. "A Fisher's Cottage," with its thatched roof and wooden pailings, is another sweet sketch; while "After a Storm" shows what Mr. Harmer can do in the rendering of lowering clouds and breaking waves. Mr. Harmer's series represents some of the finest transparency work we have ever seen.

Universal Instructor; or, Self-culture for All. (*London Ward, Lock, and Co.*)

We have been favoured with a copy of Part I. of the *Universal Instructor*, which is projected to teach almost everything, from algebra to anatomy, and navigation to music. Chemistry, geology, astronomy, &c., are included, although we see no special allusion to photography. The *Universal Instructor* aims at nothing short of a "university at home," says the Preface; let us express a hope that it will fulfil nothing short of its aim.

Photographic Society of Great Britain.—The first meeting of this Society, for the ensuing session, will take place on Tuesday next, November 9th, at the Gallery, Pall Mall East, when the presentation of the medals awarded will be made, and papers by Captain Abney, R.E. F.R.S., and Major Waterhouse, will be read.

The Photographic News.

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CONTENTS.

INCREASING THE RAPIDITY OF COLLODION EMULSION.

In most of the formulæ published for collodio-bromide emulsion we find that about 5 to 6 grains to every 20 grains of bromide of silver is recommended as giving good and certain results—and, when we say good results, we mean density of image, good flowing qualities, and rapidity. There is no manner of doubt, however, that the reduction of this quantity of pyroxyline improves collodion emulsion in many ways, and tends to give negatives which are more plucky and rounder than if the full dose of pyroxyline is employed. We may also point out that, as has already been shown in our columns, this diminution of dissolved matter also materially increases rapidity, even when the ordinary alkaline developer is employed, and notwithstanding that more soluble bromide is required in it. The question at once arises, are there any methods by which still greater rapidity can be attained? Our answer to such a query is, that we believe there are several. We believe that collodion emulsion is capable of attaining every bit as great a rapidity as gelatine emulsion, since the sensitive substance employed is precisely the same in both cases, and can, therefore, be brought to the same physical state. Having got it in that condition, the only question that remains is the mode of development.

Now, the addition of bromide to the developer—be it the alkaline or the ferrous oxalate developer—undoubtedly destroys, to a certain extent, the latent image; and we believe that the great point to aim at is, to be able to use a developer which shall contain no bromide at all, or, at least, the smallest possible trace, possibly something like hydro-kinone. In a gelatine emulsion we have the means ready at hand; the gelatine is a mechanical obstruction to the action of the developer, which only penetrates very gradually through the colloidal body, and thus is able to reduce the particles of the sensitive salt which have been acted upon by light before it can reduce the neighbouring particles which have not been so affected. Collodion, be it remembered, is very much like a layer of fine sponge, in which the bromide of silver lies embedded; it immediately soaks up the developer, and every particle has a chance of being reduced to the metallic state, unless soluble bromide be present to form a temporary alliance with the particles which have been unacted upon by light, such a compound being with difficulty reducible by the developer. Suppose we introduce into the pores of the collodion (before exposure) in the shape of preservative, a body which is colloidal, or, at all events, possesses the same property as gelatine, the emulsified silver would, in that case, be surrounded by it, and the development should proceed, it would appear at first sight, as in the gelatine process. It may be said that gelatine itself will answer as a preservative, and we know that it will to a very large extent. We have, for instance, been able to reduce the soluble bromide in the developer to a very large extent, and thus to produce plates which are 3 or 4 times as sensitive as an ordinary wet plate, but which, after a phantom image full of detail had been developed, gradually fogged when it was endeavoured to obtain full density. The amount of gelatine present in the collodion film was necessarily small, and any extra amount above that quantity which the film would take up would lie above the surface of the film, and would necessarily be useless, since it was not in contact with the sensitive film. We believe, however, that by minimizing the pyroxyline in a collodion emulsion, and by using a suitable preservative, a still greater advance in rapidity will be made.

The preservative must be insoluble in water, but not impervious to it, and should be soluble in alcohol, and should possess the properties of a colloid body. It must likewise not be forgotten that some other substance may take the place of pyroxyline in the collodion itself, and act as a preservative at the same time. Indeed, this becomes a necessity if the emulsion be made with much less than five grains to the ounce of solvents, since it is then very unmanageable in coating, having a tendency to be crapy, and to yield a granular film when dried. When, therefore, minimizing the pyroxyline, care must be taken to avoid these defects. We hear on all sides a certain amount of grumbling against the difficulty of intensifying gelatine plates with silver, and we believe that, as at present made, this difficulty is one which will not be very easily overcome. It is for this reason that we point towards a rapid collodion emulsion, not only as a possibility, but as something which must before long become practicable.

A NEW IDEA FOR BACKGROUNDS.

Under this title Mr. L. W. Seavey recently read a paper before the Chicago Convention, which we deemed it our duty to place before our readers. The name of Seavey is as well known in this country as in the United States, and any suggestions of his on the subject of backgrounds is always worthy of attention. The "new idea," as our readers will remember, referred to the employment of large initial letters, beside which the sitter is posed, and we are now in a position, thanks to our Philadelphia contemporary, to supply our readers with the illustrations necessary to fully comprehend Mr. Seavey's suggestion.

Mr. Seavey proposes the construction of monster letters, about six feet six inches in height, and represented as if made of the branches and trunks of beech, birch, and other woods with the bark on. These rustic structures are then trained with running vines—such as the ivy, myrtle, clematis, or rose, in order to soften the sharpness of outline.

S. Seavey's Monogram or Initial Accessory. — L. W. Seavey's Monogram or Initial Accessory. Patent Pend No.

It is Mr. Seavey's idea to have a letter of this kind to correspond with the initial of the sitter's name. Thus, if a young lady of the name of Clara were to be photographed,

she would be posed within the circular opening made by the letter C. She might be sitting on the lower part of the rustic background, as if it were a bench, or be standing with her right hand holding the upright portion of the letter C. If such pictures were not suitable for all occasions, they would still serve excellently well for birthday or wedding cards, or for the photographer's show-case.

As photographers, however, could not be expected to provide themselves with twenty-six letters fit and proper for the taking of all nominees, from Ada to Zoe, Mr. Seavey suggests the making of combination letters. Thus the letter I, of which we give a sketch, can be transformed into F, E, T, J, and four other letters; while C, G, O, and Q may be successively constructed of the same materials.

There cannot be a doubt about the pleasing poses that might be hit off in some cases with these letter backgrounds or accessories, but the thought naturally occurs whether the same effect could not be secured with the aid of less cumbersome machinery: whether, for example, it would not be possible by skilful double printing to produce the same result at less cost and trouble to the photographer. Mr. Seavey shows how a structure may be made to serve for one letter or another, and possibly photographers could go further, and by simply posing in a certain manner, produce portraits which would "print into" letters from stock negatives.

Some very clever printing-in is now done for Christmas cards, the framework around being a photograph from nature, just as much as the picture in the centre. Recourse to lithographed or engraved marginal designs or to coloured work, let it be ever so well executed, always detracts from a photograph, from the fact that there are incongruities which refuse to be reconciled; but one photograph surrounded by another photograph—supposing they have both been produced by the camera—make up a whole which is usually harmonious, and sometimes truly artistic.

We have before remarked on a very useful and artistic accessory to be found in Mr. Mendelssohn's studio at Newcastle-upon-Tyne, and Mr. Seavey's rustic alphabetical background calls it once more to mind. It is an accessory easily procurable, and one that appears natural in a picture, for the simple reason that it is itself a bit of nature. The accessory we refer to is the trunk of a young pine simply placed in a horizontal position in the studio. A tree has been cut down, and a length of it, without being trimmed or smoothed, conveyed to the studio. The slender trunk of a silver birch, or of a cherry tree, would answer equally well, the rustic upright serving as a pleasing adjunct to any standing figure. Indeed, in the present Exhibition may be seen a portrait of Mr. Mendelssohn's, in which the tree accessory we refer to is to be seen to advantage.

Notes.

Our Year-Book of Photography, now in the twenty-second year of its age, will be published on the 20th prox.

For any articles and memoranda, especially of a brief and practical nature, with which our readers may favour us, we shall be truly grateful, and thrice grateful to those who kindly send us *early* contributions.

A book on silver printing, from the pens of Mr. H. P. Robinson and Captain Abney, R.E., F.R.S., is in the press. Two such competent authorities should produce a valuable work between them.

One would have thought there were already photographs in plenty, and to spare, of Mlle. Sarah Bernhardt, but it seems that Sarony, of New York, has offered no less than 1,500 dollars if the talented actress will permit him the sole right of taking portraits during her brief stay in that city. A large number of cartes and cabinets will have to be sold before a profit of £300 can be made.

The largest sum ever paid in this country for a portrait negative is still, we believe, that given by Messrs. Marion and Co., for a cabinet picture of the Prince of Wales in Masonic dress. It was purchased for £85, and in this case the negative was not new, but had been extensively printed from. An equestrian portrait of the late Emperor of the French was only valued at 300 francs, on the occasion of a recent lawsuit, while two little negatives taken by an itinerant photographer at St. Germain, of Thiers, the day before that statesman's death, were sold for 3,000 francs, or £120.

Mr. J. W. Swan has been lecturing at Newcastle upon the electric light, and astonishing his audience with the fact, which we announced some months ago in these columns, that the electric illumination of our rooms and dwellings has been accomplished. We ourselves sat in a room lighted by electricity for more than two hours, and so soft and agreeable was the illumination that it ceased to be subject of remark after the first few minutes. The light proceeded from an incandescent thread of hardened carbon enclosed in a vacuum tube to prevent decomposition.

Mr. Swan is now able to tell us something about the economy of his electric lamp. He can get double as much light, it appears, out of a thousand feet of gas if he employs this in a gas engine to grind out his electricity, than if he burns the thousand feet in jets. This is, indeed, a victory. His actual words are: "I am warranted in saying that at least twice as much light will be produced by a certain quantity of gas used to generate an electric current employed in my lamps, than would be obtained from this quantity of gas burnt in gas burners in the usual manner." That such a stride in electric illumination should have been made by one so well known in the photographic world as Mr. Swan is a matter for hearty congratulation.

A good deal may depend upon a portrait being like or unlike—five years' penal servitude, for instance. The other day a coiner was convicted before the Central Criminal Court, and a warder from Millbank attended with a photograph to prove that the prisoner had already suffered for the same crime. Upon the question of identification depended the man's sentence—whether it should be five years or ten years. The judge scanned the portrait, shook his head dubiously, and submitted it to the jury. Despite the warder's positive statement, neither judge nor jury would believe in the photograph, and the prisoner received the lesser sentence.

The *Times* now publishes daily a transcript of the Kew photographic records. The curves and zigzags traced upon sensitive paper by barometer and thermometer, which form a ceaseless tell-tale of our meteorological changes, are now put, by breakfast-time every day, before thousands of readers, who thus benefit by the valuable work which the handmaiden photography performs so surely and so well. The ever-watching camera is never caught napping; it never overlooks the least rise or fall in the mercury column, it never makes a mistake.

Our readers will remember that some six months ago we gave an example of a photographic thermogram and barogram in these columns, and fully explained the manner in which these were obtained, in "At Home at Kew Observatory."

It is rumoured that at the Gaiety Theatre a scene will be produced in the next Easter piece, representing "Geneva from the Quai des Bergues." The scene is to be minutely painted from photographs taken on the spot, so that the principal buildings, gardens, mountains, &c., may be recognized, and tourists familiar with the locality may take a real interest in the production.

The popularity of Albert Smith's pictures of Chamounix, Mont Blanc, &c., was due in a great measure to the fact that his audience were familiar with the scenes that were shown them, and which were painted with much detail and accuracy. Photography makes the work of the realistic scene-painter much easier than it formerly was. We remember some years ago a glacier scene in a burlesque of William Tell which was painted and constructed after one of William England's fine pictures of snow fields and ice pinnacles.

The pores on the surface of a glass plate are very minute, but they occasion a good deal of mischief sometimes. Mr. Jabez Hughes, who, as we all know, has had considerable experience in carbon development upon glass plates, tells us that he cannot safely employ new glass for his work. The carbon film sticks so tenaciously to the surface that it frequently refuses to leave at all, except in a piecemeal condition. Only when the pores of the glass have been filled by frequent usage is the plate to be employed successfully as a support for the carbon print.

This is a matter photographers should bear well in mind, for it is not only in carbon printing that the unpleasant truth proclaims itself. In enamelling prints the fact is frequently met with, and this is just the reason why pictures will not leave the glass plate at the end of the operation. At the Sarony establishment at Scarborough, where a good deal of enamelling is done, the use of old glass plates is an invariable rule. The gelatined print, after it is pressed down upon the collodionized and gelatined glass, and dried, is found never to leave the plate with ease, unless the latter has been for some time in use. No amount of talc, or French chalk, will make a new plate act like an old one.

Here is a good gelatine story. In a certain town of Bavaria, next door to one another dwelt two photographers—brothers in art, if not in affection. No. 1 succeeded so well in emulsion-making that, after a while, he completely out-distanced No. 2, whose most strenuous efforts only resulted in a very insensitive material. So No. 1 had it all his own way, until one day a new batch of emulsion of his refused to set. He tried another sample of gelatine, and another, but all to no purpose; night after night did he put the gelatine compound to wash, only to find it dissolved and washed down the sink in the morning.

Now it was the turn of No. 2 to flourish, and right merrily did matters go with him, until presently a crisis came. The crisis was the other photographer. No. 1 had found out how it was his gelatine dissolved away in the washing. His supply of water had to come through his neighbour's house, and No. 2 had ingeniously removed the earth from underneath the water-pipe, and lighted a charcoal fire underneath, thus laying on a supply of warm water every night. The two photographers quarrelled after this, and refused to be neighbours any longer.

Topics of the Day.

ON THE ACTION OF LIGHT UPON BROMIDE OF SILVER: A TEST FOR DECOMPOSITION OF GELATINE.

BY J. VINCENT ELSDEN, B.SC. (LOND.), F.C.S.

It is a fact, perhaps too well known amongst the makers of gelatino-bromide dry plates, that failure in the preparation of good emulsion may arise from several different causes. Fog on development is not always a sign that actinic light has been admitted in some way into the dark room, but may have its origin in certain other causes, amongst the most frequent of which is, perhaps, decomposition of gelatine, owing either to atmospheric conditions or to prolonged cooking at a high temperature.

It would be obviously of immense advantage to many photographers, both amateur and professional, whose experience in making dry plates is not yet sufficient to enable them to trace failures to their true origin, if some ready means existed whereby it might be easily ascertained in what direction to look for the cause of fogged plates in each particular case. In how many instances has the window been covered with sheet after sheet of ruby paper, and the photographer, in the full belief that his light is at fault, been compelled to work in almost absolute darkness, when, in reality, the cause of his failure lay completely in another direction?

I think, however, that there exists a simple means whereby a correct judgment can be given, at least between the two most frequent causes of fogging, viz., the imperfection of the arrangements for the exclusion of actinic light, and decomposition of the gelatine.

It recently came to my notice that a photographer, having made a batch of bad plates, looked at one of them in daylight, and found that it darkened rapidly. He concluded at once that this proved something to be not right, and that a different sort of gelatine must be used; but in this he was wrong, for all plates, good and bad alike, will be found to darken in strong daylight.

But a great difference exists in the colour ultimately attained by good and bad plates. So far as my experience has gone, I have found that decomposition of gelatine invariably causes gelatino-bromide of silver to assume a pink tint in sunlight, and the more decomposed the gela-

tine, the warmer will be the tone of such plates. A good plate, on the other hand, when placed for a time in strong daylight, darkens to a cold grey slate colour, with no apparent tint of red in its composition. It will be seen, then, that the presence of a pink tint, on exposure to sunlight, forms a simple and convenient test for the presence of decomposed gelatine; and it would be advisable for makers of dry plates, on meeting with failure, to try this experiment before attributing their want of success to other causes. An exposure of even a few minutes in a bright light is quite sufficient to complete the test. It would, perhaps, even be well if a small quantity of the emulsion were always submitted to this test before proceeding with coating, for the disappointment which a batch of foggy plates brings is increased in proportion to the labour and care bestowed on the emulsion; and to be saved the trouble of coating and drying plates which are of no use would be an advantage obvious to all.

In order to be in a position to endeavour to arrive at the cause of this red colour, as well as to trace the connection, if any, between this appearance and what is known as red fog, it will, perhaps, not be out of place to give a short account of what is known with respect to the action of light upon bromide of silver; and more especially does this seem desirable seeing that many are apparently ignorant of the fact that this salt, like the chloride, does rapidly darken in sunlight. If an ordinary gelatino-bromide dry plate is exposed beneath a negative to the action of strong sunlight for some time, it will be found that a grey, slate-coloured positive print is visible upon it. The further action of light upon the exposed parts produces no deeper tone, however long it may be continued, for, as soon as the surface is once altered, the particles lying beneath are completely sheltered from the light, and remain unchanged. After immersion in the hyposulphite bath, the impression is barely visible, and evidently consists of a very slight deposit of metallic silver, since it is completely dissolved by cold dilute nitric acid.

Pure bromide of silver, prepared in a non-actinic light, when brought into ordinary daylight, rapidly changes from a yellowish white, first to bright yellow, then green, and lastly to the same cold grey colour observed on the gelatine plates which have been similarly exposed. These changes are evidently analogous to those which the chloride undergoes under the same circumstances; but there has been considerable discussion as to the nature of the final product, whether it is a sub-bromide or metallic silver. The probability is, that it is a sub-bromide, since cold dilute nitric acid has no bleaching action upon it.

The chemical change which the bromide undergoes is, then, probably to be represented by the following equation:—

$$2Ag\,Br = Br + Ag_2\,Br.$$

In any case, it is certain that free bromine is eliminated during the exposure to light. This may be proved beyond doubt, either by special chemical tests, or, more simply, by the odour which is evolved. Pure bromide of silver prepared in the dark room is without smell, but the moment it is brought into light a very perceptible odour of free bromine is to be detected.

The action of hyposulphite upon the exposed bromide also favours the theory that a sub-bromide is produced, for it dissolves entirely in the fixing bath, with the exception of a small residue of metallic silver. This would seem to show that the hyposulphite reduces the sub-bromide to metallic silver and bromide, dissolving the latter as hyposulphite of silver, as in the equation—

$$2Ag_2\,Br + Na_2\,S_2\,O_3 = Ag_2 + 2Na\,Br + Ag_2\,S_2\,O_3.$$

I have noticed, also, this difference between the grey and pink plates when treated with hyposulphite of soda. In each case nearly the whole of the silver is dissolved as hyposulphite, with a slight residue of metallic silver appearing as a fog over the plate; but the deposit upon a pink plate is perceptibly greater than that upon the good grey plate. The pink colour disappears from the former, but the plate becomes somewhat thickly coated with a grey fog. This would seem to show, as would be expected, that the presence of decomposed organic matter tends to increase the reduction which the silver undergoes on exposure to light. It is possible that decomposed gelatine extends the action which, under the influence of light alone, is merely superficial. The presence of a larger quantity of reduced silver salt, however, is scarcely a sufficient reason for the great difference in colour exhibited by a good and a bad plate.

On the whole, then, it appears that the darkening of bromide of silver is a property which this salt possesses in common with the chloride, and is independent of the presence of organic matter; but that the pink or reddish hue produced in some plates is abnormal, and is owing to the presence of organic matter in a state of decomposition.

Being now in possession of the chief facts relating to the action of sunlight upon bromide of silver, it remains to be shown why the presence of decomposed organic matter should affect the colour produced.

We must not forget that in the development of the latent image we produce an effect very similar to that which has just been described. In this case, also, we have an elimination of free bromine and a reduction of the silver salt, but the change is carried to still greater extent. Bad plates, also, in this case are veiled by a red fog; but the connection, although it seems not improbable, is, in the present state of our knowledge, by no means proved. It may be mentioned that the red colour in bad plates exposed to light is unaffected by oxidizing agents, such as nitric acid or potassium bichromate; neither does it yield to the bleaching action of chlorine and bromine. Caustic potash has no apparent effect upon it, but ammonia seems to exert an influence similar to that of hyposulphite. Perchloride of iron is without any effect.

It is to be hoped that further information will be forthcoming upon this point, and its connection with red fog confirmed, or satisfactorily disproved.

The "Topic" for next week will be "On Artistic Printing," by Valentine Blanchard.

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."

No 11. THE WRECK!

"What are the wild waves saying?"

THIS negative was taken, if my memory serves me, in 1866. It is a dark gloomy-looking picture. The blocking out of the leaden sky lends to it a more sombre appearance. It is the remains of a once noble steamer, parted amidships; the masts, funnel, and bulwarks, battered to pieces; cordage dangling limp over the bare stanchions; the bowsprit hanging by a single rope, and moving lazily in the water; the water itself covered with flotsam and jetsam of the wreck. In the background is the pier of South Shields.

Yes, it was on the "Black Mittens" we were wrecked.

It was the *S. S. Stanley*, bound from Aberdeen to London. I was coming up to look for a situation, and parted with my little wife on the quay, choosing rather to go and find a home for her, than to have the extra anxiety of having her made miserable in hotels or coffee shops. It was a cold dark night; the wind carried showers of sleet with it; the swell on the bar, as we crossed, swept the deck, and drenched us poor steerage passengers to the skin.

Dark—dark—dark! Nothing heard but the whirling of the wind in the cordage; the groaning of the machinery; the splash of the foam, as we dash into the water. Nothing seen but a few shadowy, shivering figures, together with the captain on the bridge, and the man at

the wheel. Aha! a light on shore; it is the light at Girdleness; it raises my sinking spirits, and I watch it affectionately, until the dark range of the Kincardineshire coast hides it from my view. I have made many a journey by water, but never have I witnessed such depression as seemed to weigh every one down on that awful voyage. It is said that coming events cast their shadows before, and I am convinced that not one on board was there but felt an indefinable dread of a danger to come. I am rather volatile, and generally make friends wherever I go; but I must honestly declare that all my conversational powers seemed to have leaked out since on board that ill-fated ship. I tried to engage the steward in conversation, but he only nodded and yawned in answer. I tried to engage an old lady, with a huge, light-blue umbrella, but she only groaned. I next tried my hand upon a recruiting sergeant, but he stuffed his cap half way down his throat, and struck a bee line for the bulwarks. In the corner of the cabin sat a man—rugged, weatherbeaten, and brown—the huge muffler and pilot jacket he wore, together with his general appearance, telling plainly that he was a "jolly tar." I felt that I was right here; there was no sea-sickness about him; we would get on famously. I opened conversation by requesting a light to my pipe; then I added, "Rather a rough night, eh!"

"Wait until we double Flamborough Head!" was his laconic and significant reply. He then pulled his billycock over his eyes, hoisted the muffler round his nose, closed his mouth, and snored. I mused for a bit in solitude, and then I did the same. After having twice picked myself up off the floor I thought I would go on deck and see what was doing there. By Heavens! There was a sight never to be forgotten. When a boy I have lain in shelter amongst the "bents" of Scotston, and watched the wild waves of the Pentland dash their thunders over the black rocks of Katiray Head; I have seen the spray fly over a hundred feet in height; but the storm that the poor *Stanley* tried to weather caps it all.

"All passengers get below!" was the hoarse shout of the captain. My answer to this was to button up my coat and help a "tar" to make fast a coil of rope; my next job was to rescue the old lady with the blue umbrella, who was being drowned slowly in the forecastle. As I carried her under the bridge, I heard the captain remark, "It's not the first time that chap has been at sea!"

And now commenced our sufferings. There were upwards of thirty-five women and children on board, with about twenty males, who, I am sorry to say, behaved more like old women than men. Some of them wept, and some of them prayed, and they hugged one another in the most maudlin manner. Here let me say one word in praise of the stewardess—she behaved liked a heroine—calm, cool, and self-possessed. Oh! that awful day! Not made awful by any terror I had for myself, but to see those women and children in paroxysms of fear and sickness, makes me shudder even now. Towards evening I managed to get hold of a biscuit and a bottle of Bass. I made my way to the lee of the captain's little deck cabin: there he stood in the doorway, a stout old grisly tar, with anxiety depicted in every line of his deep marked face. He was scanning the sky when I first went up; one eagle glance he gave me; then, with an expression I never shall forget, he remarked: "That's right, my lad! put it into you. You'll want it all before morning!"

Little did I think I should require it so much.

That biscuit and Bass I believe did not only save my own life, but about twenty others. My strength had been giving way; but when I got that "into me," to use the captain's term, I felt like a lion refreshed.

"We will never make the Humber, captain," I heard the first mate remark.

"I can see that!" growled old grisly, as he calmly lit his pipe with a fusee. Then came the order "Bout ship!"

"What's up, old fellow?" I whispered to the mate as he passed me.

"Our only chance is the Tyne, now," was his hurried answer. And now the captain got on the bridge again. Two lights appeared—one larboard, one starboard; right ahead I could discern two brilliant lights crossing and recrossing as we pitched in the raging water. We were now within the pier heads; the lights were the low lights of North Shields.

"Thank God, we have passed!" I heard Captain H—— fervently remark. Hardly was the word out of his mouth when there was a rush—a cloud of water—impelled by some infernal force—struck us on the weather side. Again and again came that awful over-power of strength and water. Then came the cry that thrilled every soul on board: "Breakers ahead!"

The captain now did his best. The engines were instantly reversed. It was no use; we were in the thick of the boiling surge. In less than two minutes there was a crash. "She's struck!"

And now distress rockets were sent up into the ink-like darkness. Crash, crash, crash! and the screams of the women and children! One young man, a groom, was so overcome with fear that, before anyone could restrain him, he plunged overboard, and was drowned. I believe a life-boat tried to reach us—I cannot say anything about it, as I never saw it; but one thing I saw and heard, that was the bonfire of the Cullercoat men, and their cheering shout. Here let me give those Cullercoat men the praise that is due for their noble exertions on that fearful night. There was not one there but what proved himself a hero. Chain after chain was formed with an inch line round their waist—dashed and battered about by the wild waves. They never left their post until every soul was off the wreck.

I had a little bit of trial on board that wreck, and that is the reason that I prize this negative so much. After we had put the cattle (and there were a good few on board) overboard, and let them swim ashore, or drown, then came a most enormous sea, a sea that bodily lifted the vessel and dashed her right on those ugly black rocks She was an iron-built steamer, and that last sea broke her back. There was a gap of at least twenty feet between her bow and stern. I was the only man left on the forecastle along with about twenty women and children. Out of all the lot that was left with me there was only one little child drowned, and it was dragged ashore by those noble Cullercoat men firmly clasped in my left hand. I had done my best!

I believe I raved for a few days after that awful scene; but a kindly voice acted upon me like magic, "Geo.! Geo.! don't you know me?"

About a week after I strolled from the Dolphin to the scene of the disaster, and then it was that I bought this negative. It was done by a wandering photographer, and sensitized in a bath that had been worked to death. It is pinholey and measley; it is weak, and intensified with bichloride of mercury and iodide of potassium. Still, when I lift it up between me and the light, I feel as if I would not part with it for any money. I feel indeed as if it was part of myself. I feel that there is a vein of poetry in this dark, dingy bit of glass!

RAPIDITY AND PITTING OF GELATINE PLATES.

BY W. BARRY HULL.

With reference to the difference of opinion as to the rapidity of gelatine plates referred to more especially in the article under the heading "In and Out of the Studio," of Oct. 22nd, 1880, does not the following throw some light on the matter?

I find the plates I prepare are workable with two exposures—one rapid, that is about two seconds, but which require considerable tact and management to develop out a printable negative; but still it can be done by modifying the developer, and spending some five or six minutes humouring

it. This cannot be effected in practice with a busy day around you, so I increase the exposure to six or eight seconds, and using double quantity of pyrogallic, the negative can be developed out to printing density at once, as quickly and as easily as a wet plate. Now which system of development is to be taken in fixing the standard for rapidity? Doubtless the makers of plates anxious to dub them asra pid as possible adopt the first; but the second is the one which the consumer uses, and I think finds the most practicable, and hence he is out of reckoning. The old saying is truer than ever in gelatine plates, "experience teaches."

Many thanks to Mr. Edward Dunmore for his article on pitting, October 15th, 1880. Previous to its appearance I thought I was the only photographic mortal so plagued, but have now found consolation, and, more important, a remedy. I attributed the defect to grease, but now cure it by using the emulsion much warmer, but still on a cold plate. I have not been so troubled since, although I have made and used a gross or more of plates, and from different batches of emulsion.

Correspondence.

PRICE OF GELATINE PLATES.

DEAR SIR,—I see a letter in your last issue of the NEWS' on the price of gelatine dry plates, signed "Free Trade.' There are some very sensible remarks in the letter regarding the present costliness of some of these plates.

If the high price of some of them were a guarantee of excellence and reliability, I should not write this to you; but, as you know from specimens I have sent you from more than one maker of reputed excellence, the name and high price are not always a surety for good plates.—Yours truly,

FRANCIS W. TURTON.

COLLODION *VERSUS* GELATINE.

DEAR SIR,—Your estimable correspondent and excellent investigator, Captain Abney, makes some interesting remarks upon an opinion expressed in "In and Out of the Studio," a fortnight ago, respecting the rapidity of gelatine plates, and maintains his assertion that the latter are fifteen to twenty times as rapid as wet plates. I am glad to hear that he has observed this sensitiveness only with his *own* plates, the qualities of which are naturally unknown to me; but it will certainly afford us all much pleasure to know he can double or treble the sensitiveness of gelatine plates. But I hope he will pardon me if I maintain my opinion in regard to the best gelatine plates *in the market*.

I have tried in the meantime the matter over and over again in conjunction with an excellent portrait photographer, and can only say that if a really fully-exposed negative is required to be taken in the studio with all necessary detail in the shadows, an exposure of not less than a quarter of that desirable for wet plates is required, while you will do still better to give one-third of the time.—Faithfully yours,

THE WRITER OF THE ARTICLE "IN AND OUT."

Proceedings of Societies.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE Annual General Meeting was held in the Religious Institution Rooms on 28th ult. Mr. JOHN URIE (President) occupied the chair.

The minutes of the last General Meeting, and of the subsequent meetings of Committee and of Council, were read and approved of.

The PRESIDENT gave a short review of the progress of photography during the past year, and mentioned the various improvements that had taken place in the art and appliances connected therewith, and particularly referred to the general use to which the dry plate process had now attained.

The meeting approved of the resolution of Council to extend to 1st December next the time for sending in the pictures intended for competition.

Thereafter the election of several new members and subscribers took place.

The Treasurer's account for the past year, with the Auditors' docquet thereon, were submitted to the meeting and approved of.

The meeting then took into consideration the recommendation by the Council as to holding a photographic exhibition in Glasgow, and, after some discussion on the matter, resolved to defer further consideration thereof.

The meeting appointed Mr. Gardner to prepare a design for the gold medal to be given by Mr. Long for competition among the members for the best dozen transparencies.

The meeting took into consideration the matter of presenting a print to the members, and, after examination of various specimens, resolved to present to the members a mounted print of "Balmoral Castle," by Mr. Wilson, of Aberdeen.

The proceedings then closed.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held on Thursday evening, the 28th ult., at the Free Library, William Brown Street, Mr. J. H. T. ELLERBECK in the chair.

The minutes of the last meeting having been read and confirmed, Messrs. J. L. Corkhill and J. W. James were elected members of the Society.

A discussion ensued on the subject of the presentation print for 1880, and on the motion of Mr. J. H. Kirkby, seconded by Dr. Kenyon, it was finally decided that eighteen negatives by members of the Association should be selected by the Council, and printed by the Woodburytype process, for distribution.

The TREASURER announced that several presentation prints for past years remained unclaimed, and it was the opinion of the meeting that all pictures not appropriated by the close of the year should be sold.

Mr. PHIPPS called attention to the rapid disappearance of the older portions of the city of Liverpool to make room for modern buildings and improvements, and suggested the preservation of photographic memorials of such scenes as a very useful and legitimate work for members of the Association.

The exhibits at the meeting consisted of an instantaneous shutter by Mr. Sale; Fletcher's solid flame burner, by Mr. J. H. Kirkby; instantaneous pictures by Mr. Knowles, of Bolton; and some enlargements of diatomaceæ by Mr. Bruce.

The SECRETARY then gave a lantern exhibition, with the sciopticon and the Society's lantern, of views in Belgium, France, and Switzerland. Some of the transparencies were highly appreciated; but the interest of the exhibition was enhanced by the fact that a new four-guinea lantern lens was tested competitively against the common lens attached to the Society's lantern and a new cheap sixteen-shilling French lantern lens exhibited by Mr. Knott. It was thought that the expensive objective possessed a slight advantage in the degree of illumination of the disc, but that in point of definition there was nothing to choose between the lens at four guineas, and that at sixteen shillings.

The meeting then adjourned to the last Thursday in November.

Talk in the Studio.

DR. VOGEL'S EMULSION.—We are glad to hear that there is now a prospect of photographers in this country being enabled to experiment with this emulsion, Dr. Vogel informing us that the first batch leaves for England this week. We see that the Commission appointed by the Vienna Society has reported very favorably upon the emulsion.

Messrs. ELLIOTT and FRY, of 55, Baker Street, Portman Square, W., have prepared a series of photographs of Mr. and Mrs. Kendal, as they appear in *William and Susan*, at the St. James's Theatre. The photographs, says the *Daily News*, are well executed.

Photographs of Old London.—The *Times* says: "When we first gave publicity, in 1875, to the proposal originated by some artists to photograph the old inn entitled the Oxford Arms, then about to be pulled down, we never anticipated that from so slight a beginning, a Society for Photographing Relics of Old London would spring into existence. Such, however, was the case, and the present year is the sixth since the formation of the Society, which yet shows no sign of decreased vigour. During the above-mentioned time the Society has published sets of photographs, printed in permanent carbon, of many of the most interesting parts of Old London—parts which are, it is needless to tell our readers, changing every day under the spell of sanitary reform and modern improvements, and soon will have their only existence in the pages of Charles Dickens, or in the Society's photographs. Though no one wishes, or thinks it possible, to arrest the march of the destroying angel, yet many cherish a faint regret, allowable, even if it be unwise, over the disappearance of the old houses under whose overhanging windows they have trodden for years, and pace with a comfort, chastened by remembrance, the wide streets and well-paved roads which have taken the place of the narrow footways and rough pavements of Old London. To such, at least, this Society should appeal, secure of its success, and, by its help, they will be able to potter, as of yore, down an unchanged Fleet Street, loiter in the shade of Temple Bar, and stroll down to Warwick Lane for a glass of ale at the Oxford Arms, without stirring from their comfortable arm-chair. The present series will not be to such *laudatores temporis acti* the least interesting, for it represents the old school-house within whose rough stone walls many of them received their earliest instruction and passed their happiest hours. The affection of old Carthusians for the old Charterhouse is well known, and it is the old Charterhouse of James I. and Thackeray that the twelve photographs of this series represent. Here is the Grand Hall, with its carved galleries and panelled walls, its great fireplace and massive tables; here is the staircase; here, too, is the Wash-house Court, the oldest remaining portion of the building, dating back to the time of Edward III.; here is the massive carved staircase, dating back to the time when the house belonged to the unfortunate Duke of Norfolk; here the Governor's room, where two English Sovereigns have held Courts; and here the founder's tomb, in fitting conclusion to the series. Were it only for its associations, Charterhouse has a claim upon every Englishman's sympathies, though we fear it will soon fade from recollection now that the school has been removed into the country. One recollection, however, is entwined with the courts and passages of this old building which will not easily fade, and that is the remembrance of Thackeray's youth, and the Managers of this Society for Photographing Old London have done well in giving a prominent place in their descriptions to the words of the author of *Vanity Fair*."

Photography on Hampstead Heath.—Henry Hutchins, a photographer, appeared before Messrs. Smith, Joseph Hoare, Fletcher, and Lock, in answer to an adjourned summons, charging him with unlawfully placing a photographic apparatus on Hampstead Heath, without the consent of the Metropolitan Board of Works. Mr. C. A. Roberts, from the solicitor's department of the Metropolitan Board, prosecuted; Mr. Kimber, solicitor, defended, the Magna Charta Association having taken the case up as one affecting public rights. A general and specific prohibition of photographic apparatus being placed on the heath was issued by the Board, and it was alleged that in spite of this the defendant continued to place a tripod with a camera thereon upon the heath, whereby he was liable to a penalty of 40s. for each offence. Mr. Kimber contended that the photographers on such a place added to the public enjoyment, and that the tripod did no more harm than a walking stick on the heath. The Bench imposed a nominal penalty of 1s., with costs, but told defendant he must not repeat the offence.

Too Bad.—Brown has a wife and seven children; and they have never been photographed. Struck with a "gem" taker's announcement, "nine for sevenpence-halfpenny," Brown knocked off for half-a-day, went home, had the youngsters' hair curled and their best toggery put on; and himself and his missus arrayed in their go-to-meeting clothes, the procession started—all nine of them—for the photographer's. But he only took nine of the baby for the money, and Brown, having lost half-a-day's wages, isn't sure whether he can't have the law of that photographer.—*The Yorkshire Era.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

Nella.—You could hardly paint out, but the objects might easily be vignetted out; see "At Home" this week about vignettes. 2. Touch the transparent spots on the negative with vermilion, and you will then be able to make good the defects on the print with a little Indian ink. 3. You can hardly alter the light side of the face now; place a white screen close up to the shadow side of the face before working, and then the light will be more evenly distributed.

Jones.—You will have no difficulty in keeping your bath in order. When brown or muddy, add a little kaolin, and subsequently filter or decant. Always bring up to strength before re-using. You should tone and fix as soon as printed; if you must keep the prints, let them be preserved in a dark and dry locality. The group is a very good one; the stain is due to some liquid having been carelessly spilled upon it. We do not advise you to unscrew your lens, and we know the maker would not sanction such a step under any circumstances.

A. Grigg.—You may use either citric acid or acetic acid, but the former is generally preferred.

W. B.—We do not know. Voigtländer is a Viennese optician.

F.—The focus of the lens, supposing it were a single one.

A. Georghan.—You must apply to the publishers first, and we may frankly tell you that they are not likely to grant you permission.

Tommy.—Thirty-five grains to the ounce.

Little'un.—Float your paper, and then wash. Roll it up so that the light does not get to it, and when printing use a pad that has been fumed with ammonia. You did not wash, hence the discolouration.

T. T.—We doubt it. We believe Messrs. Rouch and Co. can tell you something about it.

X.—Thank you for the story, which you see we have inserted. It is a very good one. As boys say, "Tell us another."

One in a Muddle.—It is carbonate of silver evidently. What have you been doing to your bath?

Beginner.—The most recent article on the subject you will find in the News of 27th August, under "In and Out."

Advice.—We will enquire into the matter ourselves.

W. W.—The address of Mr. W. Brooks is 2, Laurel Villas, Warren Road, Reigate. Acetone is a body with varying qualities, and so, for that matter, is gum-dammar; you will find the latter will dissolve with very little residue in either ether or alcohol.

Enquirer for Light.—We are sorry to say we have had no practical experience of either, and cannot therefore pronounce an opinion. Prices have lately been reduced, so you had better write; you will find advertisement a few weeks back. But do not be in a hurry to purchase, as this winter is likely to see some marked improvement in artificial lighting.

M. F. C.—Exactly the same dimensions as the ordinary leather lithographic roller; a backing of flannel under the velvet is desirable; the roller is made up in the ordinary way, and requires skilful sewing.

M. Jordan.—1. For formulæ see News for Aug. 20th, May 21st, and April 30th. Sensitiveness depends just as much upon "cooking" as upon formula. 2. If the boxes are of seasoned wood the negatives will be all right. 3. Till dry, and the drying depends as much upon air current as temperature.

Advance.—Churchill and Sons; there is, we believe, an eighth edition now, a seventh having been published some years ago. You will see a criticism in the first News published in June of the year of the Exhibition.

Captain Turton.—We received your card, and shall have much pleasure in acceding to request. The collodion you refer to is not as yet sufficiently matured for commercial purposes.

H. Stone.—Thank you.

Americanus.—See answer to Captain Turton.

An Assistant.—They are probably due to imperfect fixation, and would appear during washing, or soon after.

Iron.—There is clearly an error in the calculation.

K. U.—Each member has the privilege of giving away tickets; the price of admission is one shilling; sixpence in the evening.

Collodion.—Try one grain of bromide of cadmium to each ounce; it is possible that may restore the sensitiveness.

G. B.—Thanks for your contribution; it will doubtless be of interest to our readers.

S. F.—We must make enquiries, and will answer in our next.

W. H.—Many articles on the subject have appeared in the Photographic News, to which we will refer you if you will state a little more definitely what you require.

E. F. S.—Received. Thanks.

The Photographic News, November 12, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Vienna International Photographic Exhibition—Collotype Printing Process—Rose-Coloured Albumenized Paper—Blisters in Albumenized Paper.

The Vienna International Photographic Exhibition.—Three weeks ago we gave an account of the approaching Vienna Exhibition, and expressed the hope that portraits and landscapes would be put rather more in the foreground than they were in the Belgian Exhibition. Now we have received the programme of the Austrian Exhibition, and learn from it that we had been greatly mistaken in our expectations. Landscape and portrait photographs seem to be excluded. In the programme, historical pictures are announced, illustrating the development of different photographic processes—also heliography, Woodbury process. Lichtdruck, photo-lithography, photo-zincography, applications of photography to art, manufactures and schools, instruments, new photographic processes, and works illustrated by photo-mechanical processes. Not a word is said about portraits or landscapes. Prizes are also offered—viz., silver and bronze medals and certificates of honourable mention; but portrait and landscape photography is not mentioned in the prize lists, so that it has more the character of a *photo-mechanical* than a *photographic* exhibition.

Collotype Printing Process.—Collotype printing is practised little in England and France, but much in Germany. The collotype process may be said to have been invented at Metz, by Tessié du Motay, but it was improved and made of practical application by Albert of Munich. We are informed that there are about forty collotype printing establishments in Germany, about ten in France, and scarcely half a dozen in England. It is said that the English climate is not so favourable for collotype printing as the Continental, because it is damper; but, on the other hand, we are informed that the "Lichtdruckers" in Munich get the best prints if the weather is a little damp. It is further said that few Lichtdrucks are prepared in England, because only limited orders are given for them. If orders for Lichdrucks were given, it is said, then Lichdruck establishments would not be wantiug. But we know that there are twenty presses in action in the collotype printing section of the Autotype Company, and thus there is already a call for the collotype in England. We hear that in Germany the collotype printing establishments are occupied generally with—(1). Illustrations for artistic or scientific works. There are a good many of such works in Germany, illustrated in this way. (2). Reproductions of old engravings or pencil drawings. The engravings of Dürer, Holbein, Rembrandt, and others are reproduced very accurately and cheaply by Lichtdruck. (3). Taking pictures of specimens of ancient and modern art industry. All the first rate works in wood, bronze, iron, &c., which are exhibited in the art industrial museums of Germany, are reproduced by Lichtdruck, and many thousands of these pictures are used by art students and workmen. (4). Taking pictures of landscapes and architectural views. A great many of the pictures purchased by travellers on the Continent are silver prints, but many of the larger architectural views sold in Germany are collotypes, and they are so similar to silver photographs, that anybody may mistake them; very often shopkeepers sell them as ordinary photographs, and, curiously enough, deny that they are collotypes. A great many of these architectural views are used for study in architectural schools. No pictures will ever be prepared so cheap as those by Lichtdruck, and in consequence orders for Lichtdruck establishments will never be wanting. At present the Lichtdruck is not used for portraits. A year ago strenuous endeavours were made to introduce the Lichtdruck into portrait *ateliers* in America. It was called "Artotype" there. A company of shareholders patented it, and sold licences for working the process. A number of photographers obtained the latter, but nobody works any longer with it. The American climate, by reason of its extraordinary changes between damp and dryness, may probably put more difficulties in the way of its working than the English. Lichtdruck is used in Germany in many cases for reproducing maps, but in most cases photo-lithography is preferable for this object. The stone can always be retouched; corrections can be made to a great extent, which is not the case with Lichtdruck. The importance Lichtdruck has obtained in Germany is best shown by the fact that there are three German handbooks on Lichtdruck, two of which are in the second edition.

Rose-coloured Albumenized Paper.—The employment of rose-coloured albumenized paper for silver prints is increasing. It is well known that this paper is coloured with fuchsine, which changes very quickly in daylight, so that the rose colour fades very soon. Trapp has now prepared a rose-coloured albumen paper, which is not changed by light. This paper seems to be coloured by alizarin; we have exposed it eight days to sunlight, and observed no change at all. This reminds us that not only rose-coloured albumen paper, but also purple collotype, fades in the light. Purple collotypes are printed with a fatty ink containing crimson lake, and it would be better to substitute alizarin for the latter.

Blisters in Albumenized Paper.—Blisters generally occur in summer, but it happens sometimes that they appear also in cold weather. Much has been written on this subject, and the matter does not seem to be quite settled yet. Some photographers use four or more different fixing baths if they have blistering paper, and make each a little stronger than the next; thus with four baths of 80, 50, 25, and 12 grains per ounce, they would fix the print in the first, and then put it in the other three in succession. Other photographers prefer to use only one very weak fixing bath (about 20 grains per ounce). In a bath as weak as this, the pictures must remain about half a hour before they are completely fixed. Others recommend the use of alum, &c., in the silver bath, the action of which is somewhat doubtful. A manufacturer informs us that the reason why more complaints are made now about the quality of albumen paper than three years ago is, because nowadays weak baths are generally used. This is no doubt true to some extent, for formerly printing baths of 80 grains were in vogue, while now baths of about 40 grains are in general use, and it may be concluded that the albumen is better coagulated with the stronger bath than with the weaker; but, on the other hand, it must be remembered that the albumenized paper now in the market contains much less chloride than that manufactured ten years ago, and therefore a strong bath is on that account no longer necessary. Even with strong baths blisters are not avoided in all cases. It seems to us that the blisters must arise when the adhesion between the albumen film and the paper is not strong enough. It may be that spots of greasy matter in the paper interfere with the adhesion of the albumen solution, and on these spots blisters are formed. The following is a very convenient method for avoiding blisters, which has given us excellent results: a solution of eight grains of chloride of sodium in an ounce of water is prepared, and the plain albumenized paper is floated on its back in this bath, until the albumen film becomes smooth, which is easily observed by feeling; then the sheet is dried in the usual manner. The paper is softened by the water in this operation, and therefore the albumen impregnates the pores better. A chloride solution is used, because with pure water the paper would lose some of its chloride.

PITTING OF GELATINE PLATES.

BY W. BARRY.

Since my communication on this subject, last week, I have had occasion to use some emulsion hurriedly—that is, I had to wash and melt, and use at once; when, to my surprise, I

experienced the worst case of pitting that ever came under my notice. The plates were perfectly useless, so I reasoned thus: if Mr. Dunmore's theory of air in the gelatine being liberated on coating the plate be the cause, I'll give it the opportunity to liberate itself, and disperse before using. I therefore poured the defective emulsion into a shallow dish, and kept it at 100° for six hours, and then coated my plates without agitating it, when lo! the pitting had all disappeared, and the plates were all that could be desired. I think this points conclusively to air in the gelatine as the cause of "pitting."

At Home.

ON SCARBOROUGH SANDS.

When there is no east wind, and the piano-organs are out of hearing, few watering-places are so pleasant as Scarborough. There are none, indeed, to equal it for beauty of situation, and gaiety. On one side the white terraces of the south cliff—lofty, handsome buildings, following the bend of the bay below; on the other, at the foot of the castle, the quaint old town of red-tiled houses, nestling beside the busy harbour, always crowded with fishing-boats from every port on the coast. From Yarmouth, from Whitby, from Lowestoft—nay, even from far-off Penzance—brown-sailed luggers come to gather in rich harvests that abound off Scarborough and Filey, and at night the placid bay is dotted with the twinkling lights that betoken their presence. No other seaside resort affords such a spectacle to the visitor.

In Scarborough, too, there is plenty of pleasant occupation for him. In the first place, he can do nothing, and that is very agreeable. Here, in the trim Spa Gardens, directly underneath the cliff, you can lounge to and fro along the broad terrace, listening to the bands that play in little temples at either end; or, leaning over the granite parapet, you may gaze at the yellow sands below, and the white-fringed waves as they come up in semicircles, washing one over the other. Under the colonnade of the spa building, with its massive columns of chocolate and gold, are rows of chairs for the gay company that come here to drink the waters, breathe the sea-air, and enjoy themselves; while in the pavilion itself are to be found a concert-room and theatre for further amusement. There is, besides, an aquarium, a circus, two minor theatres, and other entertainments, to say nothing of two springs of natural waters that you may sip all day long, if you like, and happen to be bilious or affected with weak nerves.

On the sands there is more to be seen. There is the smart pony-chaise, with its boy postilion, in red jacket and shining boots, indigenous to Scarborough. A favourite occupation is to hire one of these little conveyances, and to get your jockey to ride his steed along the margin of the waves, the pony's legs splashing in the water as he goes. The toilets of the ladies are another sight. Look at that group of damsels, for instance; they are three in number—tall, lithe, handsome forms. They wear tight-fitting jersey-like jackets, and their trim skirts are equally close-fitting. Of their neat boots and high heels they are particularly proud, for the dresses are all brief enough to show these to advantage. One has a garment of dove-coloured silk, with a broad sash of cardinal red; that of the second is dark brown velvet, with silver lace and silver ornaments, capped with a Scotch bonnet of the same material; the third is robed in a pinafore dress of dainty chintz, and a coquettish beaver hat. All are furnished with high-crutch sticks, of black ebony, employed for the most part in prodding the soft sand, and these sticks, taken in conjunction with the "Old Mother Hubbard" heels, impart a delightful quaintness to the costumes. But here comes papa, and we had best leave off staring.

What else is the right thing to do on Scarborough sands? Well, you can have your portrait taken. At one spot there are six cameras; at another, three more. Evidently, to be photographed is fashionable, and we decide upon being fashionable. We go round and look at the specimens, which are hung around the movable dark cupboards. Here are some nice little group pictures taken on beach and lawn, and several good portraits well detailed and cleverly posed. They are collodion positives—all of them—and, as we examine the photographs one after another, we think what a pity it is that such a beautiful process should be so little practised. In the end we fix upon "E. Taylor, Scarborough," and we ask if he takes pictures by the new rapid process. He says: "Yes"; and so he does, it turns out, but not in the way we meant. In fact, his process is so rapid, that, within five minutes and a-half of giving the order, a very good picture of the sea wall, with ourselves in front of it, is put into our hands.

The fee is one shilling, and we tell our friend to make all the haste he can. We time him. Of course it is a collodion positive he sets about making. The plate is quickly polished, and put into the bath; then we are led towards the sea-wall aforesaid, to be fixed up and focussed.

To give pleasure to others is said to be the greatest pleasure in life, but, in paying attention to this maxim, we rather hindered our friend the photographer. Three young urchins had clambered to a high point of vantage upon a bit of rock, whence the whole process of photographing might be comfortably watched, but, selfishly, would not permit a fourth comrade to share the entertainment. Every time the latter tried to get a footing on the slippery stone, he was pushed down again amid a good deal of scrambling and shouting. Thus it became necessary on our part to interfere with a rebuke, and to point out that one had as much right to enjoy the treat before them as the other. We insisted, too, for less noise on their part, since being photographed was a serious event in one's life, and not to be regarded with levity. This brief harangue, after we had been posed and focussed, rather interfered, as we have said, with our friend's work, and before we gave the "go," fully three minutes of the time had elapsed.

There was lots of light—due east, if you will look at the map, for we are facing the North Sea—and an exposure of two seconds sufficed. "Spectacles off, if you please," was the warning given; to our regret, we did not comply, and the portrait turned out defective in this respect. The photographer carefully shields the lens with his hat, and uncaps. In another instant he has withdrawn the slide, and buried himself in the dark tent; and before the urchins on the the stone above, and we ourselves, are well aware, the ordeal is over. Time—three minutes, twenty seconds.

Some of us might very well take a practical lesson from Mr. E. Taylor, of North Cliff, Scarborough, in rapid working. There is a place for everything, and everything is in its place. The focussing screen is immediately returned as soon as the slide has been withdrawn; the cap is attached to the lens by a short string, so that it is never missing, and always handy. At four minutes, twenty seconds, the plate is developed and washed, and we are treated with a passing glance at the result. A match is struck, and a spirit lamp lighted, over which the tiny picture is deftly moved to dry. The glass soon gets hot, and then some of "Bates' black varnish" is rapidly applied at the back by means of a camel's hair brush. Finally, the picture is fitted into a gilt frame. Time—five minutes, forty seconds.

Our friend tells us he employs Mawson's collodion, and rarely makes up a fresh bath once a year. He does not albumenize his glass, and has an idea that the albumen is apt to put the bath out occasionally; at any rate, the bath never gives him any difficulty as he works now, and he has

not made up a fresh one for eighteen months. How many of us, we wonder, could say the same?

There is plenty to do on the Scarborough Sands in the season; but, unfortunately, there is very much competition. Twenty to thirty sitters a day is considered good work, but these are red-letter days. We congratulate our friend on his rapid and orderly working, and he tells us that unless one can manipulate with speed and certainty, an out-door photographer can scarcely depend on making it pay. A bad plate, from whatever cause it may arise, not only means the loss of material, but loss of time and customers.

Our friend, naturally enough, only works on the sands in the season. He has a studio on the North Cliff, where he is to be found for the rest of the year. In the spring he usually travels, taking views as he goes from place to place. It is chance work; sometimes at a gentleman's seat he gets into luck's way, and there is a whole series of pictures to be taken of the grounds, cottages, &c., in the neighbourhood. On other occasions there are blank days, in which nothing is to be done. Much, of course, depends upon the weather; but in the spring time, just as summer is reviving, is evidently a favourable opportunity for persuading householders to have pictures taken of their dwellings. But to be successful as a peripatetic photographer, it is necessary, as we have shown, to have no little knowledge of photography, and to unite with it considerable tact and skill in rapid working.

The "At Home" next week will be, "Messrs. A. and G. Taylor, at Forest Hill."

FRENCH CORRESPONDENCE.

Photography without Light—Opening Meeting of the Photographic Society of France—Intensifying Gelatino-Bromide Negatives by Means of the Ferrous-Oxalate Developer—The Monuments to Niepce and Daguerre.

Photography without Light.—The nineteenth century is an age of marvellous scientific discoveries; so many things which were formerly held to be impossible have now become established as matters of fact, that we cease to wonder as every new extraordinary invention is published. Even the most credulous person, as regards the fertility of human invention, could only a short time ago have hesitated to believe in the possibility of a long conversation being held in the course of a few minutes between England and America. Any one at the beginning of the century who had ventured to predict all that has been accomplished by photography, steam, and electricity, would infallibly have been scorned as a dreamer of dreams surpassing those of the wildest imagination. Now we hear of any number of positives being taken from a single negative, without the influence of light, and with astonishing rapidity, and yet we hesitate to express incredulity, because one wonder the more may well have come to swell the number of marvels to which we are accustomed. In the case to which I now allude, we find ourselves confronted by the most extraordinary assertions, though there are persons of common sense and sound judgment who take M. Christian's statements as well worthy of consideration. At any rate there has been what I may call some pretence of a test. Two negatives were handed to M. Christian, who took them into another room; at the end of a minute-and-a-half he returned and handed back one of these negatives, and in another minute he fetched the record. Five minutes afterwards he produced what appeared to be a print of each of the negatives, but he could only allow them to be examined at a distance; they were placed behind a glass to which they seemed to adhere. No one was permitted to touch them, or even to look at their reversed sides. If it be true, a minute must have been sufficient for printing, and it must have taken him four or five minutes to develop. Now, did he really get these results without the agency of light? This is what he asserts, and what we are called on to believe. He also claims for his prints that they are permanent; and, advancing still further into the region of the marvellous, he maintains that, dispensing with any kind of substratum, he can fix the image, enlarged to any required dimensions, on any surface, whether of metal or of stone. He states all this, but no one has as yet seen anything of it except what I have above related.

Opening Meeting of the French Photographic Society.—This meeting was held on the 5th November last, and was numerously attended, although there was no novelty of any importance brought forward. In the last few months the reign of gelatino-bromide has become firmly established in France. A number of beautiful prints taken from gelatine negatives were exhibited at the meeting, more especially some pictures of the public buildings and monuments of Paris, taken directly on plates of very large dimensions (80 by 70 centim.) prepared by M. Stebbing. M. Chardon described his method of transferring the pellicle of gelatine plates, an account of which I gave in my letter to the Photographic News of the 23rd July, page 351. What I did not state on that occasion is, that to render the pellicle thicker he flows a second layer of gelatine over the last one of collodion, and then he covers this again with a third film of collodion. The whole pellicle is, therefore, composed of five distinct layers, instead of three layers as I first described it; in my opinion three layers would be sufficient, since the pellicle can easily be made tougher by increasing the thickness of the coats of collodion on each face of the gelatine film which bears the image. M. Jonte exhibited a new rapid shutter, presenting, however, nothing remarkable. I prefer the shutter with two rings, shown by M. Andra, although, as in all other instruments of this kind, there is no arrangement for regulating the time of exposure. The attention of the Society was attracted for a short time to a photographic print on a piece of satin by M. Jouard, of Lyons. This opens the way to a new branch of manufacturing industry, where photography may one day find one of its most beautiful and fruitful applications. The cost of this kind of printing on woven fabrics does not amount to a farthing per square yard, as was verified by the report of an expert nominated to inquire into this point by the Lyons Tribunal of Commerce. M. Bascher, through M. Audouin, presented to the Society his practical guide to the gelatine process. He also showed a studio lantern for use with sensitive preparations, in which, instead of a wick, he inserts a sponge steeped in mineral oil. M. Chardon recommended to the notice of the meeting a special developer for gelatine plates; this consists of the ordinary mixture of pyrogallic acid, ammonia, and bromide of ammonium, to which is added a small quantity of glycerine. It was stated by M. Rossignol that ferrous oxalate acts well as a developer for sensitive films of collodion emulsion. He is engaged in studying a collodion emulsion process which, as he asserts, possesses all the well-known advantages of collodion over gelatine, while it yields nothing to the latter in point of rapidity.

The Ferrous Oxalate Developer as an Instensifier.—On this subject I may inform my readers that I have employed with success a combination of the two developers—ferrous oxalate and pyrogallic acid, the latter being used to intensify the results produced by the former. A negative which the ferrous oxalate developer leaves grey and shallow, and which it would be useless to print from, is washed, and then dipped into a basin containing ordinary pyrogallic developer without any silver. The image, which was grey and shallow, at once assumes great intensity and depth. I prefer this method to developing with mercury bichloride, which, if the plates are not well washed, destroys the pictures, and makes the plates too opaque for printing.

The Niepce and Daguerre Monuments.—Subscriptions are

being raised for erecting monuments to Niepce and to Daguerre in their respective native towns. This is nothing more than justice, although there exists a sort of popular tradition among us, attributing erroneously the priority in the invention of photography to Daguerre. Now it has been historically established that Daguerre was rather Niepce's partner, and followed up his discoveries. There is much in a name; it is therefore necessary to insist on the fact that photography was invented after Daguerreotype; and it is a manifest improvement on the latter process, for it gets rid of the metallic reflection of Daguerre's plate. It is, however, still asserted that Daguerre was alone the inventor, but that he availed himself of Niepce's assistance in the scientific part of his work. The assertion rests on a letter published in the *Petit Moniteur du Soir* of the 18th of December, 1866, which, however, it afterwards appeared, was written by an old friend and assistant of Daguerre's; in this letter it is stated that Niepce was only associated with Daguerre several years after the latter had succeeded in fixing the image taken in the camera. Thus is history written! LEON VIDAL.

ON THE PREPARATION OF DRY PLATE EMULSION.

BY J. MALLALIEU.*

THE process desired by the amateur photographer is the one giving him the best results with certainty, and the smallest amount of trouble and cost, and I am convinced that this process, in its simplest form, is the one I propose demonstrating to you to-night. Compared with wet plates, or collodion emulsion, it is, when the details are mastered, simplicity itself.

In the place of a numerous and ever-varying set of chemicals, we have a very simple formula, to be put together in the most mechanical manner; and, if proper care be exercised, more constant than any process where gun-cotton plays a part. With regard to results, I find them quite equal, and I think, on the whole, superior even to my wet-plate negatives. Want of sparkle has been urged against this process; but I think in a mistake. Want of sparkle is mainly due to general thinness of the negative, or to obscurity in the shadows; and it unfortunately happens, in gelatine plates, that the latter defect is readily caused by pushing the development with ammonia, thereby staining the gelatine. But, as you will see by these negatives, it is possible to get the shadows as transparent as the glass itself, and that, too, without the aid of an iodide.

Here are three vessels. The small one is a Liebig's extract-of-meat jar; this I use to soak the bulk of the gelatine. The next is a glass tumbler, with a flat bottom, one enclosed in a light, tight tin case, half-inch larger every way, and held in the centre by small pieces of wire soldered to the bottom and sides, and this allows for a quarter inch of water all round the tumbler. The lid is conical, so that the water in condensing will run again into the case, and not drop into the glass.

The other one is an ordinary pound marmalade jar. In it I wash the emulsion; it is also used to keep the straining canvas in, &c., &c., both jars being protected, when not in use, by paper tops secured by elastic bands, and are at all times ready for use.

In the small jar I place:—

Nelson's special X gelatine	47 grains
Water	2 drams

In the tumbler I place:—

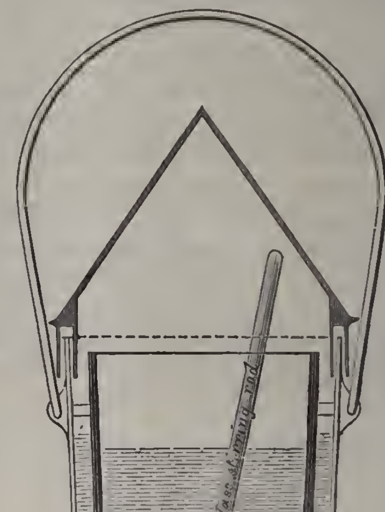
Bromide of ammonia	30 grains
Gelatine	3 ,,
Water	1 ounce

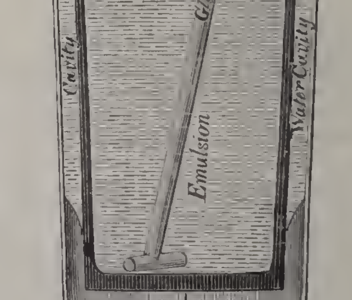
* Read before the Oldham Photographic Society.

And into a one-ounce bottle, also kept for the purpose, I put:—

Silver nitrate	50 grains
Water	4 drams

In a quarter of an hour or so, I put the tumbler and bottle in hot water. When the gelatine is dissolved, I go into the dark-room, and, using a ruby light, drop the silver gradually into the tumbler, agitating all the time with a glass rod. I now place the tumbler in the tin case, having pre-





viously put in cold water to the height of the emulsion, put on the lid, and, leaving the dark-room, place in a saucepan of boiling water, and boil exactly twenty minutes. This is equal to about ten minutes boiling, when the emulsion vessel is in direct contact with the boiling water. When cooled down so far that it can be handled, I drop in the remainder of the now swelled gelatine, stir until thoroughly dissolved, and then place in cold water until set.

All that is now necessary is to strain through the Berlin-wool canvas into the large jar, and give it four changes of water, running well off each time by stretching a piece of muslin over half the mouth, and partially

inverting. This operation lasts about five minutes, and, although the time is very short, I find it quite sufficient for landscape work, where quick plates are both uncertain, and not required.

I now redissolve the emulsion by placing the vessel in pretty hot water, and filter through a plug of wool gently pushed into the neck of the funnel. The gelatine takes up during washing, about six drams of water, making alto, gether about $2\frac{1}{2}$ ounces of finished emulsion. This coats fifteen $6\frac{3}{4}$ by $3\frac{1}{4}$ plates, which are allowed to set on a sheet of levelled plate-glass, and then transferred to the drying-box. With regard to exposure, I make it a rule to give them as much as they will bear, in order to avoid the well-known shadow stain. It is seldom I use more than twelve drops of ammonia solution to two ounces of pyrogallic and water (Wratten and Wainwright's formula), and the latitude in exposure is so great, that when I happen to lose a plate, or even require to intensify one, it is sure to be due to carelessness. The negatives before you received from three to sixty seconds.

I cannot do better, in conclusion, than recommend this process as the best and easiest I have tried or read about, and as so little trouble in practice that there is no need whatever to mix before tea, in order to see all in the drying-box the same evening. Above all things, I am careful to have exactly three grains of gelatine in emulsifying, and to give the precise time for boiling. This enables me to mix different batches of plates, and have them all equally sensitive.

Correspondence.

SPOTS (NON-ACTINIC) ON GELATINE NEGATIVES.

Sir,—Many cases of spots on gelatine plates, similar to those mentioned by your correspondent, "T. W. H.," have been brought under my notice. Of course they occur, as you point out, by contact with wet silver solution; but I have had some instances where the same has happened after the plate has been varnished, in which examples, I presume, the varnish must have been unduly reduced with spirit. The remedy I have tried, and often with success, is—when the plate has not been varnished, or if it has, on removal by soaking in methylated spirit—the application of a strong solution of cyanide of potassium on the brown spots with a camel's-hair brush, alternating with clean water, used in the same way.—I am, yours truly, A. P Chambers.

BROMO-GELATINE PLATES.

Sir,—One of the principal objections to preparing these plates at home has been the necessity for using that troublesome contrivance, a drying box—especially to amateurs, who only prepare a few plates at a time, and who have a reasonable objection to increase their paraphernalia.

By the following procedure I am enabled to coat a batch of plates, and have them dry and ready for use in two or three hours, without the employment of artificial heat. The plate is coated with emulsion as usual, and placed upon a levelled slab or sheet of plate glass to set. When set, it is at once immersed in a bath (I employ an ordinary dipping bath) of methylated spirit, where it is allowed to remain for a minute or two, then withdrawn, drained on blotting-paper, and placed in a rack to dry. I do not find the alcohol affect the sensitiveness of the plates in any way. H. C. Parlour.

THE VALUE OF NEGATIVES.

Dear Sir,—Having noticed in your valuable journal of this week's issue a brief paragraph stating that "the largest sum ever paid in this country for a portrait negative was that given by Messrs. Marion and Co. for a cabinet picture of the Prince of Wales, in Masonic clothing, and that it was purchased for £85," will you allow me, the vendor of the negative in question, to inform you that, as a matter of fact, the actual sum paid to me by that eminent firm for the cabinet picture was £185. May I ask you, then, kindly to give publicity to this statement, which will probably be of interest to many of your readers, the more especially as there is a somewhat considerable difference in the sums mentioned.—Thanking you in anticipation, I am, dear sir, yours faithfully, Charles Watkins.

THE HAMPSTEAD HEATH CASE.

Sir,—I think the Metropolitan Board of Works made a slight mistake last week when they summoned Henry Hutchins, a photographer, before the Hampstead Magistrates, for "unlawfully placing a photographic apparatus on Hampstead Heath without the consent of the Board."

It appears that that inestimable Board had issued a general and specific prohibition of photographic apparatus being placed upon the Heath in question; but Henry Hutchins violated this stern decree (their decrees are only to be compared to the laws of the Medes and Persians), and, in spite of notice boards, had the temerity to place upon this sacred piece of ground "a tripod with a camera thereon." The enormity of the crime could not be overlooked, and, as a matter of course, Henry Hutchins was waited upon by one of the "limbs of the law," who served him with a summons.

At the Court, I see the defendant's solicitor contended that the tripod did no more harm than a walking-stick (a remark, no doubt, with which many of your readers will concur), and the magistrates, taking a sensible view of the case, let the defendant off with a fine of one shilling.

Whatever prompted the M. B. of W. to promulgate such a warning is not easily understood, for what is more natural when 'Arry, accompanied by his lady, goes to enjoy his day out, that they should repair to 'Ampstead 'Eath to inhale the invigorating air, and that while there they should desire to have their "photographs taken?" They do not wish to go to a studio, but would much rather have a cheap *al fresco* portrait; nothing is more natural than that they should expect to find a photographer there, all bows and smiles ready to take their picture.

If the Board intend carrying out their plan on all public heaths and commons within their jurisdiction, there will be sorrowing amongst our Cockney friends who are lucky enough to be able to visit such plates, and it will do incalculable injury to a large body of hard-working men who cater for the photographic tastes of the public on such places.

I do hope that the Metropolitan Board of Works will, in future, take a more lenient view of our peripatetic photographers.—Faithfully yours,

A Follower of the Camera.

COLLODION *VERSUS* GELATINE.

Sir,—The principal part of my practice as a photographer is with children, and it is a matter of the first importance to obtain pictures rapidly.

I have used gelatine plates in common for about two years, and have tried at various times samples (and different samples) from most of the best known makers, with varying results as to rapidity. The plates I am now using, and have used for some months past (obtained commercially), I can assert with confidence are certainly ten times quicker than those of wet collodion, taking the average from a number of trials out of a number of different batches—for, as most photographers will bear me out, the plates of no maker are absolutely uniform.—I am, yours truly, A. P. Chambers.

The Photographic News.

Vol. XXIV. No. 1158.—NOVEMBER 12, 1880.

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GELATINE.

The use of gelatine for photographic purposes has increased to such an extent that, from being a comparasively obscure and unknown organic substance, it has risen to a position of some prominence amongst photographic chemicals; hence it is much to be regretted that, up to the present time, so little has been done towards the manufacture of samples which can be uniformly depended upon. So far, indeed, is this from being the case, that not only is there a wide difference between the samples of different makers, but there can scarcely be found even two samples from the same maker which are absolutely identical. It is even found necessary, in many of the processes for which gelatine is now used, to submit each fresh supply to a chemical examination in order to discover in what way it can be most effectively used.

One cause for this excessive variation in samples of gelatine is no doubt to be found in the fact that the substance extracted by boiling water from animal tissue is not, under all circumstances, of the same chemical composition. Thus, both from the permanent cartilages and from the temporary cartilages prior to ossification, boiling water extracts a substance called chondrin, the composition of which is represented by the formula $C_{16}\ H_{26}\ N_2\ O_7$; but from bones, white fibulous and cellular tissue, and membranes, there is obtained another substance to which the name of glutin has been given, and which has the formula $C_{16}\ H_{25}\ N_5\ O_6$.

The difference in the composition of these two substances is more apparent from the following percentage analysis:—

	Chondrin.	Glutin.
Carbon ...	49·97	50·40
Hydrogen	6·63	6·64
Nitrogen...	14·44	18·34
Sulphur ...	0·38	—
Oxygen ...	28·58	24·62
	100 00	100·00

The gelatine of commerce, consisting of these two substances, glutin and chondrin, in proportions which continually vary, can scarcely be expected to be of uniform quality, since not only the source whence it is derived, but also the age of the animal, will influence the nature of the resulting product.

Since glutin is much more soluble than chondrin, the solubility of a given sample of gelatine will depend chiefly upon which of these two substances is in excess. When we remember the requirements of the various processes in which gelatine is employed, it is easily understood why a certain kind of gelatine should be more especially adapted to each particular case. For instance, while a gelatine which is rich in chondrin is better suited for collotype work, a glutinous gelatine is found more effective in carbon printing.

Unfortunately, an easy method does not yet exist for the quantitative estimation of the amount of chondrin in a given sample of gelatine; although its presence may be detected, and an approximate conclusion arrived at, by its reactions with alum or with lead acetate: while glutin may be distinguished from chondrin by its behaviour with mercuric chloride.

Hence, there is some difficulty in procuring the best proportions of these two substances in the absence of any accurate means of determining their amounts. There is no doubt, however, but that much advantage would result from a suitable admixture of various samples known to be rich in one or the other substance. Of all known commercial gelatines a series may be made, showing a gradual transition from those which are richest in chondrin to those which, like common glue, consist almost entirely of glutin; so that, even with the samples at present existing, it would be possible, by admixture, to procure a gelatine suitable for any required work, were it possible to effect a correct quantitative determination with facility. But in all probability manufacturers will before long find a means of supplying samples which can be depended upon for uniformity of composition.

Solubility, however, is not always the most important circumstance to be considered. For some processes, such as the collotype, it is especially necessary that there should be great consistency or capability of resisting mechanical pressure. Independently of the means of increasing the toughness of gelatine by the addition of alum, this property seems to depend somewhat upon the properties of chondrin and glutin, since all the more glutinous varieties are characterised by a very low degree of consistency. The immense difference exhibited in this respect by the various gelatines of commerce is seen from the fact that, whereas the best samples can withstand a pressure of 1,400 grammes on a gelatinised ten per cent. solution, the worst kinds are crushed by a weight of 50 grammes. Solubility and toughness seem to stand in inverse relations to one another, which is another reason why, for some purposes, better results would probably be obtained by a suitable admixture of various kinds. Important as the above considerations may be in all kinds of photo-mechanical printing, to the ordinary photographer it is of far greater importance that gelatine should be free from impurities. Impurities exist to a greater or less degree in all commercial varieties, and can easily be estimated by a quantitative determination of the ash left after combustion. The amount of this ash varies from 4·5 to about 0·5 per cent., and consists chiefly of carbonate and sulphate of lime, alumina (with traces of silica), phosphoric acid, oxides of magnesium, iron, and of the alkaline metals. The presence of phosphate of lime is so universal that Mulder considers it to be an essential constituent of gelatine. This view seems more probable from the fact that true chemical compounds of gelatine with calcin phosphate can be prepared. But it is sufficient now to know that the process of manufacture necessitates the presence of this substance in gelatine.

The universal presence of these impurities in gelatine would appear to render easier of explanation the necessity for an excess of haloid salt in preparing emulsions with gelatine. Captain Abney has shown that an excess of silver may produce fog, on account of the impurities present in the haloid salt: but this mischief would be greatly increased by certain of the impurities found in gelatine; for instance, the potash proved to be present in the ash of most gelatines would form oxide of silver if the nitrate were in excess.

Commercial gelatines are frequently adulterated with a considerable quantity of alum, for the purpose of increasing their toughness and gelatinizing power; but, since as much as ten per cent. must be added for this purpose, its detection is easy, both by the large increase in the amount of ash, and by other means.

It is not improbable that the presence of even small quantities of impurities, and especially of potash and soda, exert a remarkable influence on the proneness of gelatine to decompose; for weak solutions of soda and potash dissolve and decompose gelatine even in the cold, and much more quickly when heated. This might partly account for the fact that, whereas some samples may be boiled with impunity, others cannot be kept long at a high temperature without decomposition setting in.

With the above facts in view, we can no longer express any astonishment at the great differences and apparent contradictions which characterize the methods of workers with gelatine, and which tend both to perplex the tyro, as well as to retard the true progress of photography.

THIN GELATINE NEGATIVES—AND WHAT TO DO WITH THEM.

No matter how good the plates, and how excellent the manipulation, gelatine negatives sometimes are unaccountably weak, though they may be full of the most delicate detail. The usual custom is to intensify these with some mercury salt, and so give a density which, alas! to say the best of it, is but temporary. The great fault of all mercury intensification is its want of durability, and the general use of it with gelatine plates brings its defects more prominently forward than in the late collodion era, when such intensification was more frequently employed with negatives of engravings, plans, &c., than for landscape work. If silver intensification could be easily effected, we might hesitate before we offered any suggestion as to a method of utilizing a weak negative; but such not being the case, we will recount a mode which we have recently adopted with a large amount of success, though after many doubtful attempts to begin with.

We believe that copying weak negatives on collodion plates will be found most effective, and yield prints which, as was said to us, "might be mistaken for prints from a first-hand negative." We may commence by saying that it is hopeless work to get a good transparency from a weak negative on a *rapid* plate—such, for instance, as a rapid gelatine plate—whilst a slow dry collodion plate will be certain to give one which is in every way what is desired, viz., a transparency of *medium* density, and rather denser than the original which has to be copied. In our own practice we use collodion emulsion with a beer preservative, and expose fully. To develop, we use ferrous oxalate, according to Eder's formula, but diluted to half its bulk with water. By this plan the high lights come out first, and it is not till after a fair density in them is attained that the deep shadows begin to show signs of development. When all detail is out the plate is flooded with water, and fixed. It should, if the exposure have been correctly timed, present a transparency which is rather weak, but with every scrap of detail well out. After varnishing it is ready for contact printing with another similar plate for the production of the negative.

The quality of the transparency must here be minutely noted. A dense image requires a rapid plate for the negative image; whilst a thin picture requires a very slow one. In fact, we may say, that density goes *pari passu* with slowness of plate. Supposing our transparency be of medium density, we should use the same kind of collodion plate as before described. After full exposure behind the transparency the plate is developed with Eder's ferrous oxalate developer, but this time *undiluted*, and the density which was wanting in the original will nearly always be found present in the reproduction. If further density be required, the application of pyrogallic acid and silver, supposing a collodion film to have been used, will give any extra amount that may be deemed necessary. By proceeding in this manner, local intensity—the necessity for which some people deem a *sine qua non* for a first-class negative—can be given, and the printing quality of the picture probably be enhanced. We can recommend our readers to give the above method a trial before they use mercury intensification, and we believe that after one or two attempts they will be charmed with the ease of making these reproductions.

We may add that, where a negative is too intense, the same plan may be adopted; but, in this case, a very rapid plate, and one not yielding a dense image, should be used for the transparency. From the weaker transparency a delightfully mellow negative may be produced by a little attention. We have not proposed getting transparencies by the printing-out method on chloride of silver, or on carbon tissue, as weak negatives are eminently unsuitable for the purpose. We believe that contact printing by development alone will give satisfaction.

Notes.

The Exhibition in Pall Mall closes to-morrow night.

The session of the Photographic Society has opened brilliantly—three good things announced in one evening. The first was Major Waterhouse's photo-engraving process, which is so simple, it may be explained in two words. The difficulty in obtaining a "discriminating grain" in the photograph, so as to turn it into a copper-plate engraving, is here most ingeniously accomplished. Major Waterhouse simply develops a carbon print upon a copper plate, and while the gelatine image is still wet and pulpy, he sprinkles sand over it, the sand, by-the-bye, having first received a coating of paraffin.

When the image is dry the sand is brushed off, and the result is that where there has been most gelatine (in the shadows), the sand particles have been sucked in most deeply, leaving bigger hollows than in the rest of the film. A discriminating grain, deep in the shadows and shallow in the lights, is thus secured, and, as Major Waterhouse demonstrated the other night, very tolerable impressions can be struck off, by printing in a copper-plate press. Truly there is here the germ of a most valuable process.

A communication on the development of gelatine plates by Captain Abney was scarcely less interesting. If, when developing with oxalate, you find you lack detail, add to your developer a little hyposulphite solution, and matters will at once improve. A valuable hint indeed!

The third point was made by Mr. Valentine Blanchard. He called attention to the fact that in a saturated solution of alum the photographer possessed the means of materially improving gelatine negatives which were too brown and too dense, as pyrogallic negatives very often are. Immersion for many hours removed brownness, rendered the film less opaque, and made the gelatine hard and horny.

We gave an account last week of a summons against a photographer for taking a camera upon Hampstead Heath without the sanction of the Metropolitan Board of Works. Our readers will be glad to hear there is no difficulty about getting such permission; the Board of Works readily supply photographers with a pass to any of the parks and enclosures under its jurisdiction, on application through the post.

The Royal Engineer photographers have lately performed a clever feat. It was determined recently by the military authorities to endeavour to "stalk" a balloon in the air, with a view to discover how far an enemy's fire would be dangerous to the aeronaut. With this view one of the War balloons was sent up near Dungeness six weeks ago, fortunately with no occupant in the car, and a military photographer was instructed to depict the result of the experiment in his camera.

The latter was so far successful that he at any rate managed to get an impression of the bursting shell and collapsing balloon upon his plate. The balloon was permitted to rise to a height of 800 feet, and the photographer was stationed with the cannon—or, rather, howitzer—at a range no less than 2,000 yards. A shell was burst so cleverly in front of the balloon that it sank, as grievously wounded almost as Cæsar, with twenty-five wounds in its body. The photograph shows the wounded balloon still in mid-air, and the shell bursting about 200 yards on its left.

There is no difficulty about getting ruby chimneys for the illumination of the dark room; the obstacle in the way is their high cost. For this reason many photographers employ ruby varnish, which, if properly applied, answers the purpose as well almost as the ruby chimney. We say almost, because a chimney of real ruby glass, such as are employed in our light-houses, gives a very bright as well as a very red light.

We had ample proof of this last year, when on a visit to Cape Wrath lighthouse, the most northern point of the West Coast of Scotland. Cape Wrath flashes alternately red and white over the black cold sea that stretches far away to the Arctic Ocean, and the purity of its red light, mirrored from five powerful paraffin burners, is such that it penetrates the gloom a distance of fifteen miles in clear weather. Mariners coasting about the rocky Orkneys have been able to make out the ruby light of Cape Wrath. The chimneys employed in the lighthouse are of thin fine glass, and cost from three to four shillings a-piece.

It may be mentioned, by-the-way, that, next to white light, red is the most penetrating of all the colours. Blue is very weak, and green, though better, is apt to be taken for white at a distance. Yellow, too, cannot be distinguished from white from afar off. In a lighthouse, where much depends upon the penetration of rays, the principal point is to prevent the deposition of moisture on the glass, and, for this reason, the keepers at Cape Wrath and elsewhere are compelled to keep their weary watch without fires.

It is always inadvisable to prepare a stock solution of hyposulphite of soda, a custom adopted in some studios to save time. An aqueous solution of hyposulphite deteriorates materially in keeping, and then refuses to act so energetically as a fixing agent. Therefore, if a saturated solution is prepared, it should be speedily employed. Hyposulphite is so soluble that a pound of water dissolves nearly a pound and three-quarters of the salt.

A new mode of advertising from America. "A wedding recently came off at St. Louis that involves a tale stranger even than love at first sight; the lovers never saw each other at all. He was a fortunate oil-sinker—she the daughter of a law-writer in New York. Young Petroleum struck oil one day, and decided upon marrying the next. But there were no damsels down South of the kinder fashionable fly-away sort young P. desired. He wanted something spry and degagée—elegant and high-flown—for his money. A letter came from New York congratulating him on his good luck, and in it a portrait—such a portrait!—of the law-writer's daughter. That photograph settled the business; it was one of the new promenade pictures executed in their best style by Messrs. ——, of New York.

Topics of the Day.

ON ARTISTIC PRINTING.

BY VALENTINE BLANCHARD.

So much has been written on the subject of printing, that it would almost seem that the last word had been said. I do not intend, therefore, in this article to touch upon the practical details connected with preparation of paper, toning, washing, &c., but to deal with the more important question of taste. What to do with the negative, how to bring out its highest qualities, will be the questions to be dealt with in the present paper.

A print made without taste or judgment will frequently be as widely different from the best result possible from the same negative, as a fine rubbing made by the engraver from a wood block differs from an ordinary impression made at the press before anything has been done to bring out the best points intended by the artist. To make the first impression from the wood engraving, the artist, after inking his block, places a piece of India-paper over it, and then, with an agate burnisher, firmly rubs the back of the paper, going lightly over the fine lines, but putting pressure on to bring out the shadows. If a vignette be intended in the finished work, the outer edges are scarcely touched by the burnisher. In fact, he exercises his taste so as to bring out the most artistic result possible. This impression is given to the printer, who has to endeavour by all the resources of his art to produce a like result by the press. The first impression before any art is used in the printing is a miserable production. All the lines are of equal value, except at the edges, and there they are thick and blotted. The shadows are thin and grey. Indeed, the whole print is wanting in contrast. The art workman who makes ready for the press—and on papers like the *Graphic* and the *Illustrated News* he ranks almost as an artist—now commences his work, and by lightening the impression on the fine lines, taking it off altogether on the edges of a vignette, and increasing it very considerably in all the strong shadows, he is enabled to imitate the engraver's proof, and so make the press produce an artistic result.

The photographic printer also should be a man of taste, for I think it will not be denied that very frequently more depends upon him for the perfect success of the finished picture, than even upon the producer of the negative. True artistic feeling is not to be acquired by the reading of any number of papers on art, but much may be done by the careful study of the works of the best men, for in trying to find out why this picture pleases, or that displeases, the earnest worker cannot fail to advance in his art.

There is a saying pretty well-known amongst photographers, "that a good negative will print itself." The saying has the crust and flavour of age upon it, and I for one dare not attempt to gainsay it, even if I felt disposed, and I

don't. But I am sure, even in the printing of the best negative, the presence or absence of taste in the printer will be exhibited to anyone qualified to judge of his work. The great test of a printer, in my estimation, is this: can he give harmonious results from negatives of the most opposite qualities—from the negative too dense, as well as from the negative too thin? Hard negatives destitute of half-tones are almost things of the past, but even now they occasionally crop up. The tendency at present is to produce altogether an opposite effect, and only too frequently we get negatives by the gelatine process, greatly lacking the force and vigour of the best work by the wet process. I will try and describe the best method known to myself of meeting the requirements of negatives offering these two extremes. I will deal with the hard class of negative first.

The paper should be a highly salted kind, requiring not less than sixty grains of silver per ounce in the ordinary way; but for our present purpose it need not be more than forty grains per ounce. If sufficient half-tone is not obtained with paper, then the next experiment to be tried will be to wash off the free silver. The best way to do this will be to have ready a clean porcelain dish filled with water, and when the paper has been floated on the silver in the usual way, to draw it slowly off the silver over a glass-rod attached to one side of the silver dish, so as to remove as much of the free silver as possible. Now, holding the paper by the diagonal ends, lower it face downwards on to the water bath, taking care not to wet the back. After twenty or thirty seconds it should be lifted from the bath in the usual manner, and hung up to dry. A very marked improvement in the half tones should result from this paper.

Perhaps one of the best methods for getting detail in negatives when there may happen to be masses of white which come too dense—as, for instance, in very light drapery—is as follows. Gum on the back of the negative a piece of *papier minéral.* When the corners are dry, and the paper smooth and firm, place the negative on the touching desk, the paper side upwards, and with a sharp penknife cut out all the parts that appear too dense. If the negative is too obstinate to yield to this treatment, throw it away, for it is incurable.

Of all the methods for producing harmonious prints from hard negatives, the very best of all—at least, of all those known to me—is the one I am about to describe.

Before putting the sensitized paper on the negative, turn one of the corners down—a very small corner is all that is necessary for our purpose. Now expose the paper to the light for a short time until it is slightly tinted. The amount required must be regulated by the necessities of the negative. The corner turned down will help very much in guiding the judgment, for it will show on turning it up how far the paper has gone from its original whiteness. With an ordinary negative not much too dense in the high lights, but perhaps a little too transparent in the shadows, for perfect harmony, the slightest tinting of the paper will make a marked difference. Instead of the violent contrast visible in the impression made from this negative before treatment, the print made from the slightly tinted paper will show no hard high lights nor deep shadows. In fact, there will be a much more harmonious result.

In cases where the negative is much more dense, and the contrasts still more marked, the paper may be tinted still more; indeed, it may be carried so far as to leave a visible tint on the paper, even after toning. I may add here that when the paper is only lightly tinted the slight colour disappears in the toning and fixing baths, and yet the most marked effect has been produced in lessening contrast in the print. In the method above described will be found altogether a new power in the hands of the printer, and those who have never tried this plan will be astonished at the results obtainable by it. Of course, the plan of tinting the print so as to tone down any harshness is "as old as the hills;" but the plan of tinting the paper *before* printing is not common. The first to point out its importance was M. Adam Salomon, when he was in London in 1870. I was delighted with the results, for on trying the experiment on some negatives which requiring printing until all the deep shadows were bronzed long before anything like detail appeared in the lighter portions of the picture when printed in the ordinary way, I found by the new method that the bronzing ceased, and perfect detail came out in the lighter portions of the print. Some time ago, Mr. J. Traill Taylor pointed out the analogy between this method and the plan just then advocated for letting diffused light on to the negative in the camera in order to lessen contrast and so shorten exposure. In the negative process the high lights are impressed long before the shadows, and if the exposure prove insufficient for the darker portions, then the free silver on the plate is energetically drawn to the high lights, and deposited where the chemical action is greatest. A slight amount of light all over the plate prevents this energetic action on one spot, and the silver is reduced slowly all over the plate. The deposit is still greater on the high lights, but it allows time for the development of the shadows also.

In the printing process it is in the shadows that the chemical energy is strongest, and here the action of the diffused light used in tinting the paper appears to restrain energy, and so give time for the feeblest portions to impress themselves. Let any one who may be sceptical try the experiment on a fairly dense negative—one with a decided tendency to hardness. Let him just make a print in the ordinary way, and then let him tint the paper as recommended above, and the contrast between the two prints will be so marked that he must be converted in spite of himself.

In the printing of vignettes the paper may frequently be tinted sufficiently deep to leave a permanent tint upon the paper even after toning and fixing. This tint for certain subjects is exceedingly agreeable. Prussian blue will be found a most useful friend, where the shadows are too thin. It is extremely transparent, and works very freely. It should be spread over the portions of the negative that print too quickly, of course on the wrong side of the negative, with a free working pencil, either sable or camel hair. This should be done with a quick steady stroke, never going over the place twice. Should there be any inequality, wait till the colour is dry, and then breathe well upon the negative, and, with the ball of the softest finger, stipple the colour until it is spread out in a smooth even tint. A good deal of practice is needed to do this neatly, but with patience it will come. It is most difficult to apply on the shadow side of a face, but as it is most useful here when needed, and will produce more softness in a minute than could be produced by an hour's working with lead pencil on the front of the negative, it is worth a little labour to master the method.

I have not space in this paper to do justice to the other portions of my subject; so I shall reserve the printing from weak negatives, and other matters, for another paper.

The "Topic" for next week will be "On the Application of Photography to Chemical Research," by Professor Noel Hartley, F.R.S.E., F.C.S., &c.

Proceedings of Societies.

Photographic Society of Great Britain.

The first meeting of the Session was held on Tuesday at 5a, Pall Mall East, James Glaisher, Esq., President, in the chair.

The following members were elected:—Miss Evans, Messrs. W. Adcock, G. E. Alder, John B. Best, Lieut.-Col. Durnford, G. S. Edwards, H. H. Harding, Col. Sir Charles Keyes, J. L. McLanachan, Lieut.-Col. C. J. McMahon, R.A., S. Norman, Silvester Parry, Major Pearson, R.A., F. G. O. Stuart, George Tuohy, T. G. Whaite, and G. F. Williams.

The President then proceeded to present the medals. The recipients were Mr. W. Mayland (instantaneous work); Mr. W. Harvey Barton (architectural and landscape pictures); Mr. Conway (excellence in gelatine work); Mr. Marsh (instan-

taneous work) ; Mr. Whaite (figure studies) ; Mr. Parry (excellence in collodion work) ; Mr. H. P. Robinson (studies) ; Mr. Willis (specimens of the platinotype process) ; Mr. A. Pringle (landscape work) ; Berlin Photographic Co. (for large copy of the Madonna di San Sisto) ; Mr. Warnerke (for actinometer).

The President, in the course of his remarks, adverted to the excellence shown in Mr. Gale's pictures, and the fact that Mr. Gale being a juror prohibited him from taking a prize. He also mentioned Mr. Faulkner's pictures of children, Mr. Darwin's, Mr. Manfield's, Mr. Dixon's, Mr. Mendelssohn's, Mr. Williams', and Mr. Distin's work as being particularly worthy of mention. Praise was also due to the specimens shown by the Autotype Company, and those by the Woodbury process. The jury consisted of artists and photographers, and both inspected the gallery before the numbers were fixed to the pictures, and before the catalogue was made out, and, by a singular coincidence, the awards for prizes were in each case identical. Those worthy of prizes were, however, in excess of the medals at disposal, and a selection had to be made ; but this selection he could say was made with perfect fairness and without favour. The decisions were in every case quite unanimous, and he never had to vote at all. He hoped therefore a cordial vote of thanks would be passed to those gentlemen who had so well discharged their duties.

A vote of thanks was then passed to the jurors, as well as to the hanging committee.

Major Waterhouse then read a paper on a new method of obtaining grain in photo-engraving. Major Waterhouse referred to a previous paper which he had read on the subject, and in which he recommended an alcoholic solution of tannin. This he had since found was unreliable, and he had, with the assistance of Mr. Sawyer, experimented with sand and wax, by which he was enabled to impart a grain to the picture.

Mr. Bird said, the only persons who had successfully overcome the difficulty, hitherto, had been Messrs. Goupil, whose photo-gravure process was now acknowledged by artists to rank as an artistic process, whereas photography pure and simple had not yet received that honour. He believed Major Waterhouse was working in the right direction, and that the process was capable of yielding some fine results.

A vote of thanks having been passed to Major Waterhouse,

Lieut. Darwin read a paper, communicated by Capt. Abney, on "Notes on Emulsions." The principal features of the paper were (1), that gelatine emulsions increased in sensitiveness in keeping ; (2), that the addition of hyposulphite of soda to the ferrous-oxalate developer was capable of developing satisfactorily under-exposed pictures.

Mr. Berkeley confirmed the experince of Capt. Abney as to the increased sensitiveness of gelatine emulsion after keeping.

Mr. Valentine Blanchard drew attention to the effect of alum on gelatine plates in removing the yellow colour and in reducing the intensity. Some little time ago he had taken a gelatine negative which was perfectly worthless by reason of its density and of its brownish yellow colour. He had placed it in the alum solution, and by accident it was allowed to remain there a considerable time. To his surprise, when he took it out. he discovered that the yellow colour was removed, the density was reduced, and a very fine printing negative was the result. He showed the negative to Col. Wortley, Mr. Mawdsley, and others, who were much surprised, as the result was quite new. He accordingly tried the experiment again by allowing a second negative, apparently worthless, to remain in the alum solution from Saturday until Monday morning, when exactly the same result followed. He thought the effect of alum was valuable in three respects :—1st. It removed the yellow colour ; 2nd, it reduced the density, though wł y it did so he would leave chemists to determine ; 3rd, it rendered the gelatine hard and insoluble, and on taking the negative out of the solution it dried very quickly.

In reply to a question, Mr. Blanchard said that practically the solution of alum he used was a saturated one. He might add that the process was only of use when the negative had not been previously dried. If the negative was once allowed to get dry, the alum did not produce the same effect.

A vote of thanks having been passed to Mr. Blanchard, the Chairman announced that at the next meeting the subject for discussion would be Gelatine Plates, which would naturally arise out of the Paget Prize, the award for which would be announced at the December meeting.

South London Photographic Society.

The Annual Technical meeting of this Society was held on Thursday, November 4th. Messrs. C. J. Beech and T. B. Blow were duly elected members, and some business connected with the election of officers having been transacted,

The Chairman, in a few words, stated the use of such meetings, and in the first place called upon Mr. Blow to show "a perfected emulsifier." This was a very ingenious apparatus, by which the nitrate of silver was sent into the emulsion in a fine jet, while the emulsion was being kept in motion by means of a double action whisk.

Mr. A. Brooks asked if the india-rubber tubing was effective after use, and if the silver deteriorated it.

Mr. Blow said he had not found either the case, but he had not used the same piece continually for any length of time.

Mr. E. Foxlee then showed some transparencies printed in blue tissue, being more applicable for colouring than the ordinary colour.

Mr. A. L. Henderson asked if the colour was permanent.

Mr. Foxlee answered yes, and the colour used Prussian blue.

Mr. A. L. Henderson then showed an apparatus for washing emulsion ; it was of earthenware, and had a double rebate for the lid to exclude all light, a ridge of porcelain at the bottom to support the sieve, and the water could either be admitted from the side or by a fine rose in the lid.

Mr. Eames showed a developing box which seemed rather bulky for the size plates that could be developed in it.

Mr. Werge also exhibited a developing or merely changing box, as might be desired, a very cleverly constructed apparatus.

Mr. Donkin exhibited an ingenious view meter, which was composed of a bar of metal. At one end was placed an eyepiece or hole to apply to the eye, and sliding on the bar was a frame with a hole in it the size of the picture desired ; by placing the eye to the eye-piece, and then moving the frame till the amount of view was seen through it, the number on the bar at the frame indicated the focal length of the lens to be used.

Mr. W. T. Wilkinson then showed an illustration of the use of albumen substratum. A collodion negative, the edges of which had been coated with albumen, having been left accidentally under some drops of water, the film had split up and entirely left the glass, except the parts which had been protected by a substratum.

Mr. Brooks quite differed from Mr. Wilkinson ; his experience had been that a substratum had attracted moisture.

Mr. Werge said perhaps Mr. Brooks had used too much albumen ; it required the smallest amount possible to ensure success.

Mr. Archer Clarke showed three dark-room lanterns, all of more or less utility, one of them being Mr. B. J. Edwards', which was shown later on by that gentleman himself.

Mr. C. G. Cutchey described an economical lamp he had used, composed of a piece of cardboard fitted in the shape of a triangle, with a lamp inside, and a hole cut in one of the sides, and covered with ordinary orange paper.

Mr. Chivers also showed a very ingenious dark-room lantern, very much in the form of a concertina, the bellows being made of calico and paper joined together, and then well oiled. When in use it formed a lamp about fifteen inches in height ; when closed a box about three inches high. Ingenious arrangements for the indraft of air at the bottom, and out-let at the top, are provided, and there is no risk of any white light escaping to fog the most sensitive gelatine plates. There is no glass employed in its construction, so that for travelling purposes and operations "from home" it is the best portable lantern that has yet been invented for photographic purposes. We understand that Mr. Chivers has made arrangments for manufacturing his lantern for sale, and our advertising columns announce where it can be obtained.

Mr. B. J. Edwards showed some of his new grooved boxes for dry plates, the plates travelling well in them for long distances without any extra packing. He also showed some of his ruby varnish ; also his lamp.

Mr. York explained and exhibited an elevating screen for lantern use, made by Mr. Oakely, the point being that the framework could be put together on the ground, and the sheet tied on, and then the whole raised to its proper position without the use of ladders.

Mr. W. B. Bolton showed a new dark slide for out-door work by Mr. Hare, in which the shutter is drawn out and folded right round the back instead of to the side of the camera, avoiding all the chances of wind breaking the shutter, as is sometimes the case. Mr. Bolton also showed an instantaneous shutter by Mr.

Rouch, it being on the double flap principle; also one by the same maker, in which two metal plates passed each other, a hole the diameter of the lens being cut in each.

Mr. Harrison explained and exhibited a model of a small actinometer he had made; it was composed of a gem lens, and small pieces of sensitized plates and a developing tray all fixed in one, the plates by means of a spring being pushed under the lens, and when exposed further pushed into the tray and developed by ferrous oxalate; the relative amount of light could be determined before using larger plates.

Mr. F. W. Hart then described a method of intensifying gelatine plates, the principal ingredient being sulphate of hydrogen in water.

Mr. E. Cocking then proposed, and Mr. C. G. Cutchey seconded, a hearty vote of thanks to all those gentlemen who had exhibited articles that evening.

A handsomely bound book was then passed round to the members, containing photographs taken on gelatine plates, it having been presented to the Society by Professor Stebbing.

The Chairman said he was sure the members would accept the book with much pleasure, and on their behalf asked the Secretary to convey to Professor Stebbing the best thanks of the Society for his handsome present.

A letter was then read from the Assistant Secretary of the Photographic Society of Great Britain, enclosing tickets of admission to the Exhibition for distribute amongst the members. A vote of thanks for the same was passed, and ordered to be conveyed to the President and Council.

The Chairman then announced the subject for the monthly competion as "A Study from Street Life," and after Mr. W. Cobb bad promised a paper for the December meeting on "Ballooning," from a photographic point of view, the meeting adjourned.

The Annual Dinner was held on Saturday last at the Café Royal, Regent Street, the Rev. F. F. Statham, M.A., F.G.S., President in the chair. The number that sat down was fewer than on former occasions, but the evening seemed thoroughly enjoyed by all present. After the removal of the cloth the following toasts were given: "The Queen;" "The South London Photographic Society," proposed by the Chairman, responded to by the Secretary, Mr. H. Garrett Cocking; "General Photography," proposed by Mr. F. A. Bridge, responded to by Mr. A. L. Henderson; "The Officers of the Society," proposed by the Chairman, responded to by Mr. F. A. Bridge; "Absent Friends," proposed by the Chairman; "The Photographic Society of Great Britain," responded to by Mr. E. Cocking (Assistant Secretary); "The Photographic Club," responded to by Mr. C. G. Cutchey; and the "The Chairman," proposed by Mr. F. A. Bridge. Several songs and recitations enlivened the evening.

Edinburgh Photographic Society.

The Twenty-first Annual Meeting of this Society was held in 5, St. Andrew Square, on the evening of Wednesday, 3rd Nov., Mr. Lessels (president) in the chair.

The minutes of the last annual and ordinary meetings having been read and passed, Messrs. Wm. C. Buchanan and Edward Black were unanimously admitted ordinary members of the Society.

Mr. Dobbie (the Hon. Sec.) submitted the following annual report, which was unanimously approved of:—

"The Council, in presenting the Twenty-first Annual Report, have pleasure in congratulating the members on the continued prosperity of the Society. Its ranks have been steadily increasing. and this fact, the Council venture to think, is sufficient evidence of the value and popularity of the Association.

"During the past year the Society has lost seven members by death, and twenty-eight by resignation and removal (total, thirty-five), whilst fifty-four new members have been enrolled, and six honorary members elected. The total number on the roll at present is three hundred and eighty-three, and thirteen honorary and corresponding members; the nett gain on the year is therefore nineteen.

"Thirty-one meetings have been held during the past Session, —*nine* ordinary, *two* popular, *eighteen* council and committee, the annual excursion, and the annual dinner.

"The ordinary meetings have been well attended, and the subjects brought under consideration have been of a practical and instructive character. The members invariably take an active part the discussions which follow the reading of papers.

"The 'Popular' Meetings have been *popular* in the widest sense of that term. They continue to be a pleasing element in the Society's operations, and it is believed that by their instrumentality the usefulness of the Society and the increase of its membership are to some extent due.

"There have been no outdoor meetings during the Session.

"The annual excursion to the beautiful grounds of Hopetoun House, South Queensferry, took place on the 1st July, and, as usual, was largely taken advantage of. It was a great success, nearly one hundred and fifty tickets being sold.

"The following papers were read before the Society during the Session:—'A Few Reasons why the Photographer should Study Practical Chemistry,' by Dr. Drinkwater; 'Illustrations of the Effect of Various Modifications of the Developing Solution in the Development of Dry Plates,' by Mr. Joseph W. Swan (practically demonstrated); 'A Few Hints to Amateur Landscape Photographers,' by Mr. Robert Murray, C.E. (illustrated); 'Continental Travels,'—a Communication addressed to the members of the Society,—by Mr. Andrew Pringle (illustrated); 'Remarks on Washing Prints,' by Mr. Marshall Wane; 'Principles or Rules on Pictorial Composition,' by Mr. William Neilson; 'A Few Remarks on the Working of Gelatine Plates in the Studio,' by Mr. F.P.Moffat; 'Continental Travels,' by Mr. Andrew Pringle (second contribution), (illustrated); 'A Communication regarding the Ghent Photographic Exhibition,' by the President; 'On some Recent Improvements in Platinotype Printing, and on the use of Electric Light in producing Direct Enlargements,' by Mr. W. Willis, jun. (practically demonstrated); 'A Practical Demonstration of the Preparation of Emulsion and Emulsion Plates,' by Mr. J. G. Tunny; 'Odds and Ends upon Art,' by Mr. Alexander S. Mackay.

"The following were also exhibited and explained at the ordinary meetings:—'A Collection of Platinotype Prints taken from his own Negatives,' by Mr. Alexander Mathison; 'An Improved Oxygen Apparatus,' by Mr. J. C. Morton; 'Instantaneous Shutters,' by Mr. Alexander Mathison and Mr. James Jameson. Practical Questions in the Question Box, &c., &c.

"The 'Presentation Prints' for the past Session consisted of a pair of Views of Scottish Scenery (7 by 10) by Mr. George Washington Wilson, of Aberdeen, and supplied by him to the Society on very advantageous terms.

"In conclusion, it will be found from the Treasurer's Report that the financial position of the Society is healthy and satisfactory."

Mr. Pillans next read the Treasurer's report, of which the following is a condensation:—

Condensed Report of Treasurer's Intromissions, 1879-80.

	£	s.	d.		£	s.	d.
To Balance on hand from last year, less Subscriptions paid in advance	£102	16	7	By Rents	£9	6	6
,, Arrears of Subscriptions from last year	9	15	0	,, Prntg., Postages, Clerk, &c.	38	7	1
,, Subscriptions 1879-80	106	0	0	,, Carriage of Parcels ...	1	3	8
,, Miscellaneous receipts	1	16	10	,, Expenses in connection with Lectures ...	8	17	5
				,, Subs. for Officials and Collector's Commis....	4	2	0
				,, Arrears of Subscriptions 1878-79-80, written off	12	10	0
				,, Subscriptions in arrear, 1876-7-8-9-80... ...	17	10	0
				,, AutotypeCo. for Presentation Prints 1878-79, and G. W. Wilson and Co. for Presentation Prints 1879-80 ...	52	10	6
				,, Interest paid for an advance at the stoppago of the City of Glasgow Bank	1	2	10
				,, Subscriptions received at end of last year now held as for 1879-80 ...	0	10	0
				,, Balance on Bk. Account	72	19	7
				,, Balance due by Treasurer	1	8	10
	£220	8	5		£220	8	5

This having been passed, the meeting proceeded to elect its office-bearers for the ensuing year.

President—John Lessels.

Vice-Presidents—James Henderson, James Howie.

Secretary—M. G. Dobbie.

Treasurer—H. H. Pillans.

Corresponding Secretary—F. P. Moffat.

Lecturer—W. H. Davies.

Curator—J. M. Turnbull.

Auditor—A. T. Niven, C.A.,

Council—Dr. J. Thomson, A. Craig-Christie, F.L.S., James

Small, W. Douglas, F. Briglmen, G. G. Mitchell, Thomas Pringle, John Bertram, James Crighton, William Hume, Alexander Nicol, William Ranken.

Votes of thanks to the office-bearers of past year, to the retiring office-bearers (specially Messrs. Bashford and Mathison), and to the president, terminated the proceedings.

The annual dinner took place at Young's Hotel on Friday, the 5th inst. Only eighteen sat down to table, a much smaller number than usual, owing to unforeseen circumstances. Mr. Lessels (President of the Society) occupied the chair, supported by Mr. M. G. Dobbie (Honorary Secretary), and Mr. W. T. Bashford. Mr. James Howie, Junior (Vice-President), acted as croupier.

The Chairman gave the usual loyal toasts, "The Queen, and Members of Royal Family," which was enthusiastically responded to; also the "Army, Navy, and Volunteers," replied to by Mr. Frank P. Moffat. The Chairman also proposed the "Progress of Photography during the Past Year," alluding to the rapid strides made in the use of gelatine dry plates.

Mr. Dobbie proposed "The Provost, Magistrates, and Council of the City of Edinburgh," to which the Croupier replied.

The Chairman proposed the "Prosperity of Photographic Societies," including the Edinburgh one; to which Mr. Bashford replied.

Mr. Moffat gave the toast of "Photographic Literature." Mr. Dobbie replied, giving some extracts from a letter received from Mr. George Dawson, M.A., who is a corresponding member of the Edinburgh Photographic Society.

The remaining toasts were, "The Ladies," proposed by the Croupier, and acknowledged by Mr. Strang; "The Health of the Treasurer," by Mr. Mathison, who also proposed that of "The Chairman;" and "Amateur Photographers," given by Mr. Turnbull, replied to by Mr. Lessells.

During the evening various songs and recitations were given, and although the company were not very numerous, the meeting proved to be one of the most enjoyable and happy evenings which have been spent by the members of this Society for many years.

Glasgow Photographic Association.

The first popular evening of the new session was held in the City Commercial Hall, Argyle Street, Glasgow, on Thursday, 4th inst. Mr. John Urie, the President, occupied the chair. There was a large audience present.

The Chairman, in opening the proceedings of the evening, mentioned the objects of the Association and the privileges of membership, and pointed out that a presentation print would be given to all who were enrolled as members this year, the annual subscription being only five shillings.

Mr. Swan, from Messrs. Mason and Co., assisted by Mr. Bell, gave a lantern exhibition of views in Scotland and other countries, some of the views being highly appreciated.

A selection of vocal and instrumental music was given during the evening by several amateur friends. The meeting closed with a vote of thanks to Messrs. Bell and Swan.

Oldham Photographic Society.

The ordinary monthly meeting of the above Society was held at the "Hare and Hounds" Inn, Yorkshire Street, Oldham, on the 28th of October, 1880, Mr. James Hall (President) in the chair.

The minutes of the previous meeting were confirmed, after which Mr. Alfred Knott was elected a member of the Society.

Mr. J. Mallalieu then read a paper "On the Preparation of Dry Plate Emulsion" (see page 544), during which he exhibited apparatus for the preparation of the same. At the conclusion of his paper he was asked several questions relating to the process, which he ably answered.

Several dry plate negatives were shown by Mr. Mallalieu, which exhibited very satisfactory results, and afforded encouragement to study this process. He also stated that out of a batch of twenty-four plates taken by him to Wales, he had returned with twenty-four successful negatives.

Several other topics were discussed by the members relating to improvements in photography, and after spending a very interesting evening, the meeting was brought to a close by passing a very hearty vote of thanks to Mr. J. Mallalieu for his paper and exhibition.

Talk in the Studio.

The Year-Book of Photography and Photographic News Almanac will be published on the 20th December.

Richards v. Richardson.—This was a claim for £2 8s. for a portrait in oils, brought by plaintiff, a photographer of Gloucester. It appeared that the picture was painted from a photograph, and was, originally, to cost £2 12s., but defendant had paid 4s. on account and refused to pay the balance, as he said the picture was not like him, and therefore he should not keep it. It had been agreed between the parties that if the portrait should not turn out to be a good one, plaintiff should do another. The portrait was put in, when his Honour remarked that he supposed £2 was charged for the painting, and the remainder for the likeness. Defendant said that as plaintiff had not fulfilled the order in the first place, he could not do it again He was disgusted with the portrait, and returned it to plaintiff. At the time he gave plaintiff the order, he (plaintiff) was a bill-poster. The portrait was to cost three guineas, but, in consideration of his paying cash down, he was to have it for £2 11s. He paid plaintiff 4s. deposit at the time he gave him the order. The picture was too flat, and there was no expression in it. The shading was not correct, and the eyes were nothing like his. His Honour showed that, so far as he could see, the picture was a reasonable resemblance, and defendant should recollect that a person who employed a bill-poster to paint him a likeness from a photograph could not expect to have the oil painting done in the style of the Royal Academy. He thought the performance was a reasonable one, and he should give judgment for plaintiff for the amount claimed.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

"Van" would like to know where he can purchase a living-van, of sound make, for photographic purposes.

R.—In collodion it is of no use at all, in our opinion, although it is stated by some to increase sensitiveness under certain conditions. Dissolved in alcohol or ether it supplies a matt varnish for coating collodion.

A Northern Draughtsman.—Day and Son, Harrild and Sons, Hughes and Kimber, and several other firms in London, would provide you with what you require, but you must understand lithography thoroughly before taking up with photo-lithography. A grained stone would give you the effect you mention. If you can get a copy of Major Waterhouse's "Application of Photography to Reproduction of Maps, &c." (G. H. Rouse, Calcutta), it would give you much information on the subject.

M. L.—The paper has a facing of chalk upon it, and also a little resinous matter. See answer above as to firms likely to supply it.

Myrtle.—1. You do not say if you added any nitrate of silver. 2. Chloride and some foreign matter, very likely. 3. "Instruction in Photography," by Capt. Abney, by post, 2s. 8½d.

J. Field.—Thank you for sending it so promptly.

S. S.—A grain of gold to one ounce of water. It will keep very well, only you must remember to bring up to proper strength before use.

W. W.—1. Yes. 2. We are sorry to say we do not know.

R. J. Houlson.—We will enquire for you.

Appeal for Aid.—A "Small Contributor" writes:—"I am amazed to see how slow the 'brethren' are to aid their fellow-workers in distress. Backed by such reliable guarantee, the genuineness of the case in question cannot be doubted; therefore what excuse any photographer can have for withholding his 'mite' I fail to imagine. It is clearly our duty (if not our pleasure) to contribute, so far as our means will allow, towards the maintenance of those who, by reason of some sad affliction, supplicate our help; and seeing how many suspicious cases there are about, we ought rather to rejoice at the genuine opportunity thus afforded us of doing a little real good. If each and every reader of your kind advertisement, sir, were to give, say, 2s. 6d., or even 1s., they would at least have the satisfaction of seeing a more creditable contribution list."

Oxon.—We find no disadvantage in using methylated spirit.

A. N.—We will notice shortly, but have not space at present.

A. E.—The "Malvern Portrait" is similar in shape to the "Promenade" or "Panel," but altogether smaller.

The Photographic News, November 19, 1880.

At Home.

MESSRS. A. AND G. TAYLOR AT FOREST HILL.

"You must make a good many collodion transfers here," we said, as our blinking eyes penetrated the gloom, and we became aware of animated beings busily moving to and fro. "Two hundred and eighty is an average day's work," was the reply, "and we shall do that number to-day."

It was like the lower deck of a ship—dark and vague, and with wooden machinery on every hand, the active ship's crew going about its work quickly but quietly; and yet not so much like the 'tween decks as a carpenter's room under the theatre, where there are all sorts of beams and slides and movable frames to be seen. Only there was this difference: if you go into the lower regions of the Theatre Royal Comus, among the "sinks" and "traps," you cannot touch a beam or a cross-piece without leaving an impression behind of your fingers, while in Messrs. Taylor's big enlarging room there is, as one might imagine, not a speck of dust to be encountered. As your eyes get accustomed to the darkness, you begin to perceive all the clever arrangements that exist for rapid and accurate working. There are no less than twenty-four lenses in use, and, in consequence, twenty-four enlarging stands; the lenses and cameras are let into the roof, or, at any rate, depend therefrom, so that the collodion plate for the enlargement only requires to be laid down in a horizontal position to receive the image.

But let us explain a little more definitely. It is a long room with an arched roof. There are four principal assistants, and each assistant has charge of six lenses; the six lenses are arranged in a group, so that they may be all served from one and the same platform, the assistant requiring to mount a couple of steps to reach this platform. Here is a sketch showing how the instruments are arranged.

Above is the camera (C). Daylight through an opening in the roof comes in at the back of the camera and illuminates the negative, which is in a slide (D.) The image thrown by the lens is vignetted by the diaphragm (B), and then falls upon the table (A). It is upon this table that the collodion plate is laid. The foccussing is done by the assistant moving the table up or down, a single screw permitting this action without difficulty. The table (A) may, in fact, be moved horizontally as well as vertically, by an equally simple arrangement.

It will be seen at once how quickly an arrangement of this kind works. In the first place, the light comes down almost vertical, and therefore it is the best of all lights for the purpose. In cloudy weather the light is not interfered with in the least; but in bright sunshine a screen of opal glass is employed. The assistant slips the negative to be copied into the camera; he focusses at A, measures with a quarter-plate in his hand the size of the head (for all heads are enlarged to this size), and then calls for a sensitized plate. A lad, whose duty it is to supply him with these, withdraws a collodionised plate from the bath, drains it, and simply places it on the table (A). There is no dark slide required—no loss of time involved in fitting the plate into an apparatus of any kind; it is brought bare and moist, and laid on the table. An exposure of two minutes suffices, and the film is then carried off for development.

All twenty-four lenses are of the same make—No. 1B Dallmeyer's; all the plates are coated with the same collodion, and all are treated with the same developer, &c. Consequently the work of all assistants should be the same if they work well and conscientiously. The Messrs. Taylor thoroughly believe in system, and they have here initiated a self-checking method that cannot fail to work satisfactorily.

We have been talking about collodion transfers only, but opal-coated plates are here produced under the same conditions. But we ought, perhaps, to go back a moment to the preparation of the glass, &c. The chief difficulty in making collodion transfers, or collodion enlargements on opal, as many of our readers know to their cost, is the tendency of these to stain, and on this point we had some conversation with our good friend the manager. In his opinion the staining is due, in nine cases out of ten, to the glass. "We put our glass plates in acid for a week," said Mr. Smith, "before we attempt to use them. We never albumenise, and we always employ *old* collodion." Let our readers note this. There is simply no firm in the world which has so much experience of collodion transfers, and on behalf of our readers we tender our best thanks to Messrs. Taylor for this practical straightforward advice. After leaving the acid bath, the plates are rubbed with spirit, and are then fit for use. The plain glass (which is very thick, by the way, for thin glass bends under the squeegee, and then the transfer, when stripped, is not so solid) is dusted with talc before coating with collodion; the pot-metal, which is smooth, and not ground, is coated with collodion, without, as we have said, receiving any preliminary film of albumen.

When the exposed plate is taken from table (A), it is at once developed; the developing, fixing, and washing arrangements being situated on one side of the long dark-room, while the coating of the plates and sensitizing are confined to the other. Rising out of the developing sink is a wood block, about five inches square on the top, which makes a suitable resting-place for the plate. There is no toning. The development is complete within two minutes, and the plate then put under a rose of running water; but it is not allowed to remain here many minutes, as the stream of water is not found to arrest development. The photograph is speedily popped into the hyposulphite bath, washed again thoroughly, and then backed at once. A good quality paper, not too stout, which has received a facing of gelatine, is wetted, placed upon the collodion plate, squeegeed firmly, and then the overlapping margins of paper skilfully cut off by rasping them against the sharp edge of the glass with a wooden paper-folder. When dry, the transfers strip without the least difficulty, and are then mounted on card-board for touching and painting.

To tell the truth, we are rather glad to get out of the enlarging-room, for the ether fumes cause one's eyes to smart a little sharply. Mr. Smith tells us, however, that none of the assistants suffer after being at the work for a few days, while cases of sickness are almost unheard of, and have certainly never been traced to the inhalation of ether fumes. You have to be very careful in opening and shutting the doors in this portion of the building, and the invariable rule is to close one before you open another—a regulation which is invariably complied with. On looking round once, to see if a door had actually closed behind us, and hesitating whether to go back, or run the risk of letting it be as it was, we caught sight of a warning in big letters:

EVERYBODY SHUTS THE DOOR BUT YOU.

"It's a very good idea, isn't it?" said Mr. Smith. "I

brought it back with me from Chicago, and put it up here." It was a good idea, certainly; but one don't like to be caught napping, for all that. Had no one been looking, we should have gone back and kicked that door. Only fancy being brought to book by a pale-faced bit of wood!

The room for sensitizing paper is adjacent. Messrs. Taylor's large branch establishments at Liverpool, Manchester, &c., print for themselves, but when we find 130 sheets a day being sensitized, there is pretty good proof that Forest Hill is a busy place. At the present date of writing we hear there are twenty-five branch establishments, not including those in New York, Philadelphia, Boston, and Chicago; but as Messrs. Taylor still appear to be busy annexing towns at the rate of something like two a week, we make the above statement under every reserve.

The strength of the printing-bath in vogue here is thirty-five grains to the ounce, and in respect to the collection of residues, a most systematic plan is adopted. All waste solutions containing silver, from what-ever source they come, are first treated with hydrochloric acid, and subsequently with liver of sulphur. That is to say, having been collected in large jars, hydrochloric acid is added to precipitate chloride of silver; the liquid is then drawn off into another receptacle, into which liver of sulphur is put, which naturally brings down any other silver that may be present, in the form of sulphide. By this exhaustive treatment every particle of the precious metal is recovered.

Downstairs is the printing room. It is a rule, and a very good one too, to fix down both vignette and negative in the printing-frame, at the commencement of operations, with strips of gummed paper; in these circumstances, there is nothing to fear from the carelessness of printers in permitting negatives or vignettes to slip when changing the paper, and thus getting the picture out of the centre. As Forest Hill prints for a score of branches, it is very necessary to put a distinguishing mark on the prints as they are produced; the printer who withdraws the picture from the frame does this, pencilling on the back an initial letter corresponding to the town whence the negative has come.

The spacious washing-room is next door. There are three large washing troughs of wood, lined with lead and coated with shellac. A huge rose above supplies the water, which, when it has risen to the top of the receptacle, is emptied by a syphon. Blistering of the albumenized paper is almost unknown; but the addition of spirit to the sensitizing solution, in the proportion of about three per cent., is regarded as a preventive measure against the disagreeable phenomenon. The printing is accomplished under a glass roof, which, in summer time, is covered with tissue paper.

We have no time to speak of the series of printing-rooms, mounting-rooms, sorting-rooms, &c., through which our courteous guide leads us. It is the club portrait that occupies all these busy people—a collodion transfer painted in oil; the finished production may not have much claim to rank as a work of high art, but there is an important point in all these portraits that has probably had more to do with Messrs. Taylor's great success than anything else. It is that however much, dress and garments may be coloured and beautified, face and features are simply covered with an even wash. In other words, advantage is taken of the photographic shadows that already exist on the portrait, and these supply sufficient contrast, without there being any necessity to tamper with the likeness by the application of body-colours.

In an establishment which gives employment to between five and six hundred employés, it is necessary to have strict rules and regulations. The hours of assistants are from 8 a.m. to 6 p.m.; the girls however, not coming until 9 a.m. But six o'clock is the maximum time, and many are released from their work, especially in winter, some time before this. Wages vary, of course, with the skill and capacity of the assistant; but two young ladies were pointed out to us in the painting room whose average earnings were three pounds a week.

One word on the subject of collodion making, before we close our rapid sketch. Collodion is generally three months old before use, and sometimes is even permitted to rest a year before employment, Messrs. Taylor having a firm belief in a ripe material. It is all made on the premises. The pyroxylin employed is half high, and half low, temperature material. These are the proportions:—

Pyroxylin	9 ounces
Ether	4 gallons
Alcohol	3 ,,

In twenty-four hours dissolution is complete, and the collodion is then turned into a mixing stone cask, having the tap half way up. Here it remains a week or more to settle, and is then drawn off and put into other stone jars, where it remains till required for use. As only half the contents of the mixing cask can be drawn off at a time (since the cock is half way up), freshly-made collodion is always mixed with a proportion of old. In a word, the collodion is treated in precisely the same way as connoisseurs treat their whiskey, who by this means are able to detect a flavour of the old "cratur" in every new supply.

The "At Home" for next week will be "Mr. Walter Woodbury at Manor House, South Norwood."

COLLODION *VERSUS* GELATINE.

BY W. K. BURTON.

In connection with the above controversy, and frequently before, I have seen the statement made that gelatine dry plates are more sensitive, relatively to collodion, in a dull light than in a strong one. This I have always doubted, and I think that now I can prove that it is not the case.

Let us consider for a moment exactly what the statement means. It means one of two things: either that a given amount of light, when extended over a considerable length of time, has more effect upon a dry plate than the same amount of light when extended over a shorter time, or that in the case of the wet plate the reverse is the case.

Let us take the case of the dry plate, and see if this is really true. Let us suppose two dry plates, upon one of which falls light which we shall represent by sixteen for one second, and let us suppose that on the other falls light which we shall represent by one for sixteen seconds. It is said that the latter plate will appear more fully exposed than the former. We must at once admit that if this be the case it will be so whether the lesser brightness be due to the comparative dullness of the object from which it is reflected, or by the interposition of a diaphragm one quarter the diameter of the diaphragm used for the first plate, the light from the object being the same. It is absurd to say that the plate can discriminate between dullness produced by dullness of the object, and the same amount of dullness produced by the interposition of a smaller stop.

Now, if the statement were really true that the latter plate would appear more fully exposed than the former in the case of a stop of a diameter equal to one quarter the diameter of the stop used for the first plate, we would have the rule whereby we compare the speed of lenses entirely upset. We would no longer find that the exposure required was inversely as the square of the diameter of the aperture. I think any of my photographic brethren who have tried will agree with me that this rule holds most perfectly both for wet plates and dry. I have myself tried experiments for the sole purpose of ascertaining if it does, and have not the smallest hesitation in saying that for all plates, either wet or dry, that I have tried, it does. This proves, I think, beyond doubt, that the relative speed of wet and dry plates remains the same for different brightnesses of light of the *same colour*. I believe that the reason why it has become generally believed that dry plates are so much more sensitive compared to wet in dull weather than in bright, is that—in this part of the world, at least—dull weather almost always means yellow light, and there is not the smallest doubt that bromide of silver is far more sensitive to yellow light than is iodide.

A NEW INSTANTANEOUS SHUTTER.

The accompanying engravings represent an instantaneous shutter designed by Mr. S. P. Jackson, of Henley-on-Thames. Fig. 1. is a front view; A A, two discs of card-

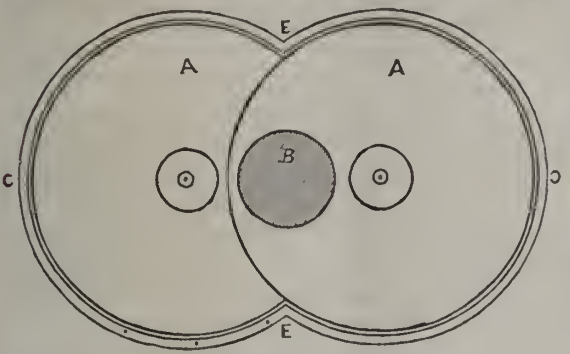

Fig. 1.

C C, mahogany frame, turned in two pieces, and joined at E E. The whole is enclosed, except the aperture in the middle.

board, or ehonite, with an opening, B, cut in each, the size of the lens. In the position of the discs in the engraving the lens is open. Fig. 2 is a side view of the hack; B B,

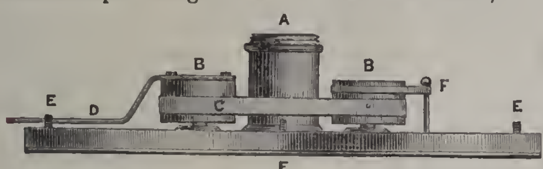

Fig. 2.

For focussing, the trigger is placed at the middle stud.

two pulleys of hard wood; C, a leather or steel haud connecting the two pulleys; D, a hrass handle and trigger; E E E, stud-pins to catch the handle; F, an india-rubber band or spring. In the position of the trigger shown, the shutter is set for use, and on being released from the stud-pin the india-ruhher hand causes the two pulleys to revolve rapidly, the discs cross in opposite directions, and the exposure of the plate takes place.

With this shutter, various scenes at Henley Regatta, passing trains, &c., have heen taken; the marvellous swan pictures of Messrs. Marsh Brothers were secured by a shutter of the same construction, the exposure being about the 130th part of a second.

ON THE DECOMPOSITION OF IRON CHLORIDE AND OF SOME OF THE ORGANIC FERRIC SALTS BY THE ACTION OF LIGHT.

BY DR. J. M. EDER.*

Iron chloride, both in the solid state and when dissolved, does not change on exposure to light; hut when mixed with certain organic substances it is rapidly reduced hy luminous action. The first ohservation in this direction was made more than 200 years ago with a solution of iron chloride in ether, at that time known as Bestuschef's nerve tincture; this solution loses its yellow colour on exposure to light.† In 1804 Gehlen further investigated this phenomenon, and discovered that the ferric chloride is reduced to the ferrous chloride, inasmuch as some of the chlorine is set free, and a little chloric ether is formed.‡ Poitevin found that a mixture of iron chloride with tartaric acid, glycerine, or alloxantin—more especially with the first of these substances—readily forms ferrous chloride under the action of light.§ When I myself also exposed a mixture of ferric chloride and tartaric acid to the light, I found besides ferrous chloride and hydrochloric acid, a little formic acid, and that with continuous exposure carbonic acid is also given off.

* Read before the Vienna Academy of Science.
† Macquer's Chemical Dictionary, 1790, vol. vi., p. 548.
‡ Gehlen's Journal, vol. iii., p. 566.
§ *Comptes Rendus*, 1861, vol. lii., p. 94.

An aqueous solution of ferric chloride mixed with citric, acid is not so readily reduced hy light as that with tartaric acid; but the mixture which I found to surpass all those above-named in sensitiveness is that with oxalic acid. Marchand was therefore quite right in using a mixture of ferric chloride and oxalic acid for the construction of his "Photantipimeter," an instrument intended to measure the intensity of light by the quantity of carbonic acid given off on exposure.* This mixture is principally acted on by the blue rays of the spectrum, and in a less degree hy the violet rays; but even the yellow and red rays have some slight effect; a long-continued exposure to gaslight is also sufficient to produce reduction. If the oxalic acid which is mixed with the ferric chloride contains nitric acid, nitric peroxide will be found in the carbonic acid set free hy the luminous action.

A solution of ferric oxalate in water is decomposed by light according to the equation—

$$Fe_2\,(C_2\,O_4)_3 = 2(Fe\,C_2\,O_4) + 2CO_2.$$

As I could trace no other products of the decomposition except ferrous oxalate and carhonic acid. This decomposition was first observed hy Dohereiner in the year 1831,† and it was afterwards investigated hy Suckow,‡ Draper,§ and Reynolds. The indigo blue part of the spectrum seems to be the most effective in producing this reaction. My own experiments have convinced me that the amount of ferrous chloride reduced from all these solutions increased considerahly with the degree of concentration and the rise in temperature. Until these relations have been thoroughly studied it will not be possihle to construct a photometer with these solutions, although Draper, Lipowitz, and Woods‖ have all tried to do so.

A mixture of ferric chloride with acetic acid or formic acid, as also a solution of ferric acetate or formiate, is non-sensitive to light. With hasic ferric oxalate I did not succeed in ohserving any decomposition under the influence of light.

Potassic ferric oxalate, and the corresponding douhle salts of sodium and ammonium, are quickly reduced by light, whether they are in the solid state or dissolved in water; this was first noted hy Bussey,¶ in 1838. The same reaction was also more closely investigated in an appendix to the treatise hy Herr Valenta and myself on ferric oxalate and its douhle salts. Under the influence of light these crystals of these salts turn yellow on the surface and lose their lustre, but the action penetrates deeper very slowly, prohahly because the yellow crust which forms is not readily permeated by actinic light. After heing exposed for some time to the continuous action of light, the crystals disintegrate. When the salts are pulverized they turn yellow much quicker, and in that state they contain, besides the undecomposed salt, an amount of ferrous oxalate, with (so soon as the atmospheric air is admitted) small quantities of hasic ferric oxalate, and both of these latter suhstances remain undissolved on heing treated with water.

An aqueous solution of potassium-ferric oxalate decomposes more rapidly in the light than the solid salt. If the air he excluded the action is given hy the equation—

$$Fe_2\,(C_2\,O_4)_6\,K_6 = 2Fe\,C_2\,O_4 + 3K_2\,C_2\,O_4 + 2CO_2.$$

Part of the ferrous oxalate crystallises out, but the rest

* *Etude sur la force chimique dans la lumière du soliel*, 1875. Marchand's solution for his photometer consisted of 10 cub. centim. of ferric chloride solution, 20 cub. centim. of a 5 per cent. solution of oxalic acid, and about 70 cub. centim. of water.
† *Schweigger's Journal*, vol lxii., p. 90.
‡ On the Chemical Action of Light, 1832, p. 27.
§ *Philosophical Magazine*, 1832, vol. li., p. 161. *Dingler's Polytechnic Journal*, vol. cxlvi., p. 29.
‖ *Kreutzer's Zeitschrift für Photographie*, 1860 and 1861.
¶ *Journal de Pharmacie*, 1838. *Journal für Practische Chemie*, vol. xvi., p. 345.

remains with the potassium oxalate in the form of a double salt. On the air being admitted there is found, in addition to the substances above enumerated, basic ferric oxalate, which separates as a flocculent red brown mass; this last must be considered as a secondary product caused by the oxidation of the potassic-ferric oxalate which has been produced by the action of light. The addition of oxalic acid prevents the separation of this basic salt, owing to the formation of the normal green soluble salt.

The sodic and ammonic ferric oxalates behave in a similar way, except that more of the insoluble ferrous oxalate is separated by the action of light; this is due to sodium and ammonium possessing a slighter dissolving power on the latter salt.

The ferric citrates and tartrates are also reduced by light. Ferric citrate and tartrate are reduced by light to the corresponding ferrous salts at first without any gas being given off; afterwards carbonic acid is developed. Ferrous tartrate is precipitated from a solution of ferric tartrate as a green crystalline powder.

Ammonia ferric citrate was used by Herschel* so far back as 1842 for the productiun of photographs, and the action of the solar spectrum on this salt was investigated both by him and by Draper.† It appears to be more especially sensitive to the blue and violet rays, but this photo-chemical action extends as far as the line F.

(*To be continued.*)

NOTE OF AN EXPERIMENT ON INTENSIFYING A PHOTOGRAPH IN GELATINE.

BY F. W. HART, F.C.S.

THE plate was exposed in Newfoundland, and brought to me with others to print from. This particular one was so very weak that the paper coloured through almost as rapidly as if under ground glass; a second print was tried in deeper shade with no better result. As it was full of detail, I was desirous to try an experiment with it, proceeding as follows. The plate being unvarnished. it was put direct into cold water, just sufficient to cover the whole plate. After a few minutes I poured into the dish half a drachm of a saturated solution of mercuric chloride in methylated alcohol, wherein it remained about fifteen minutes, turning throughout to a slate grey colour. It was now thoroughly washed, and put into a solution of hydrogen-sulphide. At this instant the idea occurred to try if it could be intensified locally (knowiug how slowly solutions penetrate gelatine). I therefore removed it from the dish, and applied fresh solution after the manner of the ordinary pyrogallic and silver in the wet collodion process, and with a most satisfactory result. There being no crystallisable salts used after washing away the small quantity of mercuric chloride, very little washing was now required, so it was just held under the water tap for a few seconds, stood to drain and dry, then heated and varnished.

It may not be universally known to photographers that there are two solutions of hydrogen sulphide prepared, one in glycerine, the other in water. I used the latter, as that is in constant use for many other purposes in my manufactory; but the glycerine solution is more suitable for those who have not the materials and apparatus in daily use for its preparation.

PHOTOGRAPHIC METHOD OF MAPPING THE LEAST REFRANGIBLE END OF THE SOLAR SPECTRUM.

IT may be within the memory of our readers that Captain Abney, R.E., F.R.S., was selected by the Royal Society to deliver his year the *Bakerian Lecture*, an honour highly courted among he Fellows of the Society. Captain Abney chose the above subect for his text, aud with his paper preseuted a map of the solar spectrum between wave lengths 7,600 and 10,750, based upon measurements from a series of photographs.

Referring first to the *action of dyes on silver bromide*, Captain Abney says:—

In December, 1873,* Dr. H. C. Vogel, of Berlin, aanounced that by means of dyed collodion films, which contained silver bromide, he had been enabled to photograph with the yellow and green rays of the solar spectrum, which had hitherto beeu supposed to be possessed of but little chemical effect. About the same time I had set myself the task of mapping the ultra-red region of the spectrum, and I was naturally led to examine the method advocated by Dr. H. C. Vogel.

If a spectrum be thrown on an ordinarily prepared photographic plate, containing only silver bromide, it is well known that the length of the spectrum impressed varies considerably from that obtained by a plate containing silver iodide or silver bromo-iodide. The commencement of the photographic action in the first case is somewhere near the liue B, or slightly below, and iu the last two, near E in the green; iu all the three the action extends to the limit of the solar spectrum in the ultra-violet. The relative chemical effects produced by the different rays show themselves by a varying thickness, or what is usually called density, of the metallic silver reduced or precipitated by the action of developing solutions. For the above-named silver compounds the maximum effect is somewhere about the line G; and if we represent the density of the metallic silver at any point by ordinates,it will be found that the area of the curve formed by joining the ordinates fairly represents the relative sensitiveness of the compound to the action of white light.

With silver bromide the curve falls gradually towards B, and similarly towards the ultra-violet. With silver iodide and bromo-iodide the curve falls suddenly near G, and the chemical effect from the bottom of this descent to E is but very feeble; whilst for the more refrangible end above G, it follows pretty nearly the curve of the bromide.

When collodion films containing silver bromide are dyed, by flowing over them an alcoholic or aqueous solution of certain dyes, and exposed to the spectrum, the resulting curves are modified in a marked manner. They almost exactly correspond to curves compounded of the absorption curve of the dye used, and of the absorption curve of the unreduced silver bromide. For exampl, if we examine a simple bromide film with the spectroscope, it will be seen that an absorption takes place along the whole visible spectrum, corresponding with the density curve of this compouud. An examination of the spectrum of eosine, supposing we are going to employ that dye to stain the film, gives an absorption baud in the green, together with a less marked region of absorption in the blue and violet. If these two absorption curves be combined, we shall find that the density curve obtained by exposing a stained film to the action of the spectrum we get a reproduction of this compound curve. Vogel explained this remarkable action by a theory which seemed to be contrary to our present idea of molecular physics; and in my experiments conducted in this direction I had the good fortune to arrive at a more acceptable solution, involving no new laws of the action of radiation on matter. Some of the dyes employed (and most, if not all, of these belonged to the aniline series) could form compounds with silver, and when brought in contact with silver nitrate, the action of light ou the compounds was perfecty intelligible. Vogel, however, pointed out that if a bromide film were perfectly freed froin all silver nitrate, by immersion in potassium bromide, then washed, next treated with tannin, and dyed, a similar density curve was obtained. I need scarcely recount the numerous experiments which I undertook; one of the final ones will be sufficient to show how a reasouable explanation can be offered.

A few granules of the dye were taken and dissolved in norma collodiou, a glass plate was coated in the ordinary manner, and the film dried and exposed to the spectrum. It was found that in those regions were the spectrum was absorbed, a bleaching of th dyed film was evident. Thus, with eosiue, a bleaching took place in the green rays, corresponding with its absorption band, aud to a lesser degree in the yellow and blue rays. If, after such an exposure, the dyed collodion were coated in the dark-room with collodion containing silver bromide in suspension, and an alkaline developing solution applied, it was found that the silver bromide was reduced to metallic silver on those parts of the plate which

* "On the Action of the Solar Spectrum." *Philosophical Transactions* 1842. See also *Photographische Archiv*, 1864, p. 467.

† *Philosophical Magazine*, 1845, vol. xxvii., p. 435.

* PHOTOGRAPHIC NEWS, December 12, 1874.

had been bleached by the action of the spectrum, and the density curve followed the curve of absorption of the dye.

Photographers have been long aware of the fact that some sorts of organic matter on a glass plate will cause the reduction of silver on those portions of the plate on which it exists. The bleached dyes partake of the nature of this organic matter, and we are forced to conclude that a state of oxidation favours this disposition. From exposure of the dyes in different media to the action of the spectrum, it seems that the bleaching is due to a state of oxidation of the dye. If a film containing silver bromide, and dyed, were exposed in hydrogen to the action of the spectrum, the density curve was that due alone to the action of silver bromide, and the dye did not affect it, excepting so far as it acted as a screen to prevent the full intensity of the light falling on the bromide.

The dyes which are most active are those which are known as yielding fugitive colours; a permanent colour produces no effect beyond the above screening the light from the silver bromide. It should be remarked that when a film containing finely-suspended matter is dyed, the change effected on the dye is much more rapid than when a continuous film is acted upon, for the dye surrounds these very small particles, and thus a large surface of it is exposed to the air, and renders oxidation comparatively easy. As a result of these experiments I can confidently state that in no case did the addition of the dye cause any chemical effect to be produced by the rays below A of the solar spectrum, nor has Vogel claimed that they do. I am aware that in the Proceedings of the Royal Society, Major Waterhouse has stated that by staining the film with turmeric he obtained evidence of the existence of lines in the solar spectrum a little less refrangible than A, but it must be observed that the lines so shown are, except in one instance, "reversed;" that is, absorption lines appear as opaque on the transparent body of the spectrum instead as of a normal character, viz. transparent on an opaque body. This reversal is a matter to which I have referred in the Proceedings of the Royal Society, and is dependent on a different action entirely to that which I am now considering.

Preparation of a film sensitive to the infra-red region.—My earliest endeavours were directed to extending this action of organic matter, so that sensitiveness of the compound might be obtained in the ultra-red regions. By weighting the molecules of the silver bromide with gum resins, the spectrum was impressed considerably below A, and the absorption lines were unreversed. Measures of the heating effect of the solar spectrum on lampblack, as shown by the thermo-pile and Sir J. Herschel's well-known researches, showed that the lower limit of the prismatic spectrum had not been reached; it therefore seemed advisable to search in a different direction for a more sensitive compound. The salts of silver still seemed the most feasible to work with, and more especially the bromide, and efforts were made to obtain this compound in a different molecular condition to that generally found. I need not detail the different methods of preparation of this compound in collodion that were carried out. In some cases I obtained it in a state which when viewed in a film by transmitted light appeared of a sky-blue colour, inclining to a green tint, visibly absorbing the red. In this condition it was sensitive to the whole spectrum, visible and invisible. There was much uncertainty attaching to the preparation; about one batch of the salt suspended in collodion out of five or six fulfilling the requisite conditions. I am now, however, in a position to prepare it without any risk of failure, my experiments of the last nine months having showed the conditions absolutely necessary for success. The following is the mode of preparation. A normal collodion is first made according to the formula below:—

Pyroxyline (any ordinary kind) ...	16 grains
Ether (·725 s.p.)	4 ounces
Alcohol (·820)...	2 „

This is mixed some days before it is required for use, and any undissolved particles are allowed to settle, and the top portion is decanted off. 320 grains of pure zinc bromide are dissolved in ½ oz. to 1 oz. of alcohol (·820) together with 1 drachm of nitric acid. This is added to 3 ozs. of the above normal collodion, which is subsequently filtered. 500 grains of silver nitrate are next dissolved in the smallest quantity of hot distilled water, and 1 oz. of boiling alcohol ·820 added. This solution is gradually poured into the bromized collodion, stirring briskly whilst the addition is being made. Silver bromide is now suspended in a fine state of division in the collodion, and if a drop of the fluid be examined by transmitted light it will be found to be of an orange colour.

Besides the suspended silver bromide, the collodion contains zinc nitrate, a little silver nitrate, and nitric acid, and these have to be eliminated. The collodion emulsion is turned out into a glass flask, and the solvents carefully distilled over with the aid of a water bath, stopping the operation when the whole solids deposit at the bottom of the flask. Any liquid remaining is carefully drained off, and the flask filled with distilled water. After remaining a quarter-of-an-hour, the contents of the flask are poured into a well-washed linen bag, and the solids squeezed as dry as possible. The bag with the solids is again immersed in water, all lumps being crushed previously, and after half-an-hour the squeezing is repeated. This operation is continued till the wash water contains no trace of acid when tested by litmus paper. The squeezed solids are then immersed in alcohol ·820 for half-an-hour to eliminate almost every trace of water, when, after wringing out as much of the alcohol as possible, the contents of the bag are transferred to a bottle, and 2 ozs. of ether (·720) and 2 ozs. of alcohol (·805) are added. This dissolves the pyroxyline, and leaves an emulsion of silver bromide, which, when viewed in a film, is essentially blue by transmitted light.

All these operations must be conducted in very weak red light—such a light, for instance, as is thrown by a candle shaded by ruby glass,* at a distance of twenty feet. It is most important that the final washing should be conducted almost in darkness. It is also essential to eliminate all traces of nitric acid, as it retards the action of light on the bromide, and may destroy it if present in any appreciable quantities. To prepare the plate with this silver bromide emulsion, all that is necessary is to pour it over a clean glass plate, as in ordinary photographic processes, and to allow it to dry in a dark cupboard.

For development after exposure I recommend what is known as the ferrous oxalate developer. This is prepared by dissolving ferrous oxalate in a saturated solution of neutral potassium oxalate, adding the iron salt till no more is taken up. To make up the developing solution, equal parts of this solution of ferrous oxalate, and of a solution of potassium bromide, 20 grains to the ounce, are employed. This mixture is placed in a clean developing glass just before development is to take place. The film is first softened by flowing over it a mixture of equal parts of alcohol and water, and is then well washed. The developer is now poured over the plate, taking care to keep the fingers from touching any part of the film. The image will appear gradually, and should have fair density when all action is exhausted.

The intensity can be materially increased by using the ordinary intensifying solutions of pyrogallic acid, citric acid, and silver nitrate. The unreduced silver bromide is removed by a saturated solution of sodium thiosulphite in water, from all traces of which the film should be thoroughly washed before being allowed to dry.

The operation of development should take place in a very subdued red light, that recommended for the preparation of the emulsion being the safest. It is, however, somewhat remarkable that when the developing action has once been set up, a greater quantity of light may be admitted to fall on the plate than before the action commences. The bromide of potassium probably prevents any further action by the light, which may account for it. It should be noted that the image may be developed by the ordinary alkaline method, though not so satisfactorily, a slight veil being usually apparent.

I may here state that by diminishing the amount of nitric acid to one-fourth the amount given in the preparation of the emulsion it is posssble in very cold weather to obtain plates which are sensitive to very low radiations, such as the radiations proceeding from boiling mercury, or even boiling water. In summer-time this emulsion, as would naturally be expected, produces what are known as "foggy pictures;" but it can be rendered of use by flooding with hydrochloric acid. In the preparation of such an emulsion the water bath must be kept at a temperature but little above that of the boiling point of ether.

For details of the apparatus employed, and other interesting particulars of Captain Abney's paper, we must refer the reader to the "Philosophical Transactions."

* If a green light of the refrangibility of about half way between E and D could be obtained, it would be better than the faint red light transmitted by ruby glass, since the bromide is less sensitive to it than to the latter.

The Photographic News.

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CONTENTS.

THE LANTERN—SOME OF ITS USES.

The optical lantern affords an example of what may be termed spontaneous scientific development. Its genus was the magic lantern, of nursery fame. But the new instrument has so far outgrown the modest proportions of its prototype as to render the task of tracing the kinship a matter of difficulty. Light, lens, and lantern have been so combined and perfected as to raise the ancient toy to a first-class rank as an optical instrument. It has, indeed, taken a place so important that it would be impossible to assign a limit to its usefulness. It alike unfolds the wonders of the spectroscope, microscope, and camera. When November fogs have blotted out all things urbane, the photographer seeks solace in his lantern. Its lime-light becomes his sun, while its perfectly-actinotized lens enlarges his views and increases his returns. Time would frequently lie fallow on his hands were it not for his lantern.

Our immediate concern is to point out how professionals and amateurs may avail themselves of the power thus placed at their disposal. When a negative awaits enlargement, and the solar rays are not forthcoming, it by no means follows that business should come to a dead lock. To begin with, a fairly good negative is required, such as shall produce an available transparency. To an expert this is as palpable as the axiom: "Things that are equal to the same thing are equal to one another." But how should he go to work about the transparency? He longs for sunlight to yield the delicate gradations of the carbon print, and in his extremity falls back upon a gelatino-bromo-iodide plate — bromo-iodide in preference to bromide, since the former produces an undoubted impression, and, under proper treatment, a transparency altogether suitable for enlargement.

It is not wise to use a rapid plate, but it is essential that the bromo-iodide of silver should exist in a fine state of division. This is important, and is best composed when emulsification has not been unduly prolonged, and when it has not been effected in too weak a solution of gelatine. Most of the well-known makers may be trusted to supply plates in every respect suitable.

The impression should, for convenience, be printed by contact in an ordinary camera slide, and by gas or lamp light. Should the plates prove uneven, and contact imperfect, a sharp impression may be obtained by exposure to the direct rays of the lantern. By this means a fully-exposed transparency may be taken in a few seconds. In the matter of development, as well as duration of exposure, experience must here guide, as no rules can be laid down in the absence of the light, plate, and negative.

This much may be said, however: a weak solution of alkaline pyrogallic will confer softness and delicacy, if they exist in the negative; whereas a strong solution has an opposite effect. A full exposure and strong solution will yield a vigorous impression,

A lantern with a four-inch condenser, fitted with lime or magnesium light, will afford ample illumination for enlargement from carte up to life-size. In focussing, a flat sheet of white cardboard may be used as a screen, having the dimensions of the enlargement inscribed in black lines. The condensing lens should be larger than the transparency, so as to ensure uniform illumination over the entire field. The objective may be any sort, provided it be achromatised and stopped down, so as to present a well-defined image on the cardboard. A wet collodion plate, well drained of surface silver, may now take the place of the focussing screen, receive the impression, and be developed in the ordinary way, and intensified at will.

"Why not a dry plate?" some of our readers may say; and we repeat, Why not? First get—or, better still, make—the dry plate large enough, and such as shall give the same vigour as the wet plate, and the difficulty vanishes. Assuming that a dry plate has been prepared, one or two small ones should be coated at the same time, and with the same material. These may be used for a preliminary exposure, so as to make certain of the film when dealing with the large one.

Passing on to another phase of lantern work, we open up a prospect of pleasant evenings to the amateur microscopist. We have a notion, perhaps mistaken, that microscopists are unlike their fellow men; they seem to betake themselves to the microscopic world in which they dwell, and find friends more congenial than the human. If they would take us with them now and again, show us the wonders in which they revel, their reward would be certain. When they have bagged a fine "diatom," or trapped some special "infusoria," let them photograph the specimen or group, and serve up the delicacy on a gelatine plate in the lecture room. It is done, but not so well or so frequently as it might be. There are myriads of microscopic objects whose surpassing beauty might be unfolded to the multitude by means of photography and the lantern.

There are simple methods by which the object glass of the microscope may become the lens of the camera. We will here indicate in outline how the two instruments may be so combined as to enable the amateur to prepare microscopic enlargements for the lantern. The operations of taking the negative and making the lantern slide are managed with gelatine dry plates.

Supposing the operator has a simple quarter-plate camera and a microscope, they should be united by withdrawing the eyepiece of the microscope, and introducing the tube of the instrument into the front aperture of the camera. For this purpose a temporary front may be fixed to the camera, pierced so as to fit the body of the microscope, and to exclude light. The stand of the microscope is then turned back to its fullest extent, so as to support the body in a horizontal position when the instruments are placed upon a table.

The body of the microscope should now be adjusted so as to project at right angles to the focussing screen of the camera. Adapt a low-powered object glass, and having placed lamp, adjust object on the stage. The reflector having been brought into operation, and the field properly illuminated, the enlarged image will be seen on the ground-glass screen of the camera, when it must be carefully focussed. The dimension of the image may, of course, be regulated at will by increasing distance between lens and focusing-screen, and the decreasing distance between lens and object.

When the image appears sharply defined from centre to edge of field, we arrive at the most important part of the process—taking the photograph. The dark slide of the camera is charged with a gelatine dry plate. The plate must be manipulated throughout under an inactinic red light (see instructions supplied on commercial plate boxes). The slide with plate may now take the place of the focusing-screen. When all is ready, the front of the slide is drawn up, the image falls upon the plate, and is there impressed.

The duration of exposure will, of course, depend upon the nature of the light employed, as well as the illuminating power of the lens and the number of diameters the object is magnified.

After exposure the slide is closed and carried to the dark-room, when the plate is developed. We will suppose that a satisfactory negative has been taken, and dried, the next step is printing a positive for the lantern. The proceedings will be a counterpart of what takes place in making a transparency for enlargement. A warm colour may be imparted to the transparency, when dried, by plunging it into a solution of mercuric bi-chloride (again see instructions for intensifying negatives) for one or two seconds, and afterwards into the hyposulphite fixing bath. The transparency may now be thoroughly washed, dried, and fitted up for the lantern. Stereoscopic photographs of objects of relief may be obtained by moving the lamp about a foot, while the blended instruments remain stationary. Two negatives are taken: in one the lamp throws the shadows to the right, in the other negative to the left. When combined in the stereoscope the object appears in perfect relief.

ON A METHOD OF IMPROVING PRINTS.

A valued correspondent has enclosed for our criticism duplicate specimens of prints, from different negatives, one of the duplicates being an ordinary print, and the other an "improved" print. A careful comparison leads us to say that the "improvement" is one of real and not merely of theoretical value. The method adopted is the simplest possible, and can be executed by anyone. It consists in sunning the back of the print after the picture has been sufficiently printed. Let us describe the two prints from a portrait negative we have before us now. The ordinary print shows that the negative is rather hard in character, the delicate tones in the highest lights being only partially and certainly insufficiently visible; the portrait, in fact, looks as if it had been printed from a negative produced by the old pyrogallic acid and silver development. The improved print, however, is vastly different. The patches of white are no longer apparent, the detail in the high lights are brought up, and there is a mellowness about the picture which could never have been produced from a negative which furnished the first print we examined, unless there was some "dodging" about it. When we examine the back of the print we find that it is of a grey black colour; in fact, of the same depth of tint that is produced when plain salted paper is fully exposed to light. When the print is examined by transmitted light, it appears perfectly opaque, showing that the action of light has penetrated deeply into the surface from the back. At first it was a matter of surprise that with such a deep printing the albumenized surface of the print had not been markedly discoloured in the whites as well. But a little reflection showed that this would not be the case, since the blackening would commence at the back surface, and only feeble light would penetrate to the albumenized surface after the first impact of light. We were informed that the back of this print had been exposed for one hour to bright sunlight. Placing the two prints side by side, the contrast was very marked. The half tints had all been *proportionately* darkened. Thus, for instance, the background in the original print, which was of a very pale grey tint, a tint which might be called a mixture of three-quarter white and a quarter black, had become considerably darker, being equal to a mixture of about half white and half black. The highest points of light remained apparently of a nearly pure white, while, as before said, the shades in the high lights of the face and hands were materially darkened. The deep shadows appeared to be entirely unaltered. There are two ways which suggested themselves of accounting for this effect. Some foreign albumenized paper is remarkably thin and transparent; and if prints be mounted on coloured or tinted cards, the colour or tint is invariably seen through the albumenized surface; and we have noticed that where India tint mounts were used there was an apparent strengthening of the shades in the high lights. When a print is sunned at the back, we in reality diminish the thickness of the white substratum on which the picture rests, and the blackening might probably show through the picture, and produce the same effect as if thin albumenized paper were mounted on a dark mount. We made a practical experiment in the matter, and found that this would not wholly account for the result. The other way by which we might account for it is that there is a slight blackening of the albumenized surface by the light penetrating through the paper. We believe that this, combined with the practical thinning of the white substratum, is the true cause of the excellent results obtained. It has been suggested to us that the same results are acquired by slightly tinting the albumenized surface before exposure behind the negative, similarly, in fact, to that described by Mr. Blanchard in our last "Topic of the Day." This undoubtedly does improve a print from a hard negative, but it is always easy to detect the artifice that has been employed, the picture always looking dead, and over the higher lights there is frequently a change in tone which often degrades the subject. If our theory be right, that the result obtained by sunning at the back is partially due to diminishing the thickness of the white substratum, it is evident that sunning the albumenized surface can never give results equal to those obtained by sunning the back. We have before us examples of landscape subjects treated in the same manner, and certainly there is a harmony of gradation introduced in the "improved" prints which is altogether absent in the others. We cannot help thinking that after a few trials, when prints have to be made from hard negatives, sunning the back of prints will be found to be an excellent and legitimate way of improving what would be otherwise faulty—perhaps "lampblack and whitewash."

Notes.

We publish a paper to-day of more than ordinary importance. We mean Professor Hartley's "Application of Photography to Chemical Research"; photography has done yeoman's service in many branches of scientific research already, and its usefulness in the domain of chemistry is very clearly set forth by Professor Hartley.

The Photographers' Benevolent Association should be doing well. We paid an evening visit to the Pall Mall Exhibition last week, and were agreeably surprised at the numerous company assembled. We are glad to see that heads of firms (as well as assistants) are beginning to recognise the aims of the Association; and since none of us know how soon bad times may overtake us, to assure ourselves against them, if we can, ought to be our first object. With the new year we earnestly hope that a large addition may be made to the roll of the Association.

A varnish or cement, which goes by the name of Chinese varnish, and renders cardboard or thick paper as hard and horny as *papier maché*, is easily prepared from blood, lime, and alum. Three parts of fresh blood, well beaten up to prevent the formation of fibre, is mixed with four parts of slaked lime, and a little alum, the thick-flowing mixture that results being at once ready for application to paper or card.

At it again. The last words of criticism we heard spoken in the Pall Mall Exhibition referred to the better weather enjoyed upon the Continent, and the consequent clearer and brighter character of Continental photographs. "It depends upon the weather," summed up the speaker, after having demonstrated to a nicety that pictures one sees abroad at Venice, Rome, Dresden, and Munich, owe their superiority to the "weather," and weather alone.

We ourselves should be glad to believe in such a conclusive argument—it looks so genuine—if it were not for the stubborn fact that landscape photography, like the art of water-colour painting, flourishes in this country better than elsewhere. We may, or may not, be good portraitists in the eyes of our foreign brethren, but they have never questioned the circumstance of our being in the front rank as landscape photographers. Indeed many artists abroad ascribe the softness and atmosphere in our prints to the circumstance that Great Britain lends itself particularly well to the landscape photographer.

In Robertson's play of "School" there is an examination of young ladies at their desks, and the question is put how many millions of miles is the sun from the earth. Many are the guesses made, as our readers may remember, one fair scholar after another hazarding a number, until at last Miss Naomi Tighe, out of patience with the wearied questioning, replies, naively enough, "It depends upon the weather." The little incident was called to mind very vividly when we heard the Pall Mall critic the other day laying down the law.

Most photographers find it useful to have a series of prices to suit customers of various classes; but the prices, as a rule, refer to the size and style of the pictures only, and portraits are not supposed to be more or less like according to the amount paid down at the time of sitting. And yet, curiously enough, if we are to believe Mr. Sala, to charge for a high or low degree of "likeness" in a portrait is not an unheard-of circumstance.

"There was a French photographer once," he writes in a contemporary, "who advertised a portrait at fifteen francs as a 'ressemblance garantie'; one at ten francs as a 'ressemblance respectable'; and one at five francs as possessing an 'air de famille.'" There is a honesty and genuine frankness we must all admire about a man who plainly says he will not undertake to do more for his sitter than produce a "family likeness," if paid but five francs for his labour; that he cannot give his whole mind to the matter, and produce a "ressemblance garantie" under fifteen francs is scarcely to be expected; but the most marvellous thing is how he manages to balance his mind and stand fairly between it and his customers when the latter bargains for a "ressemblance respectable" at ten francs.

The exhibition by a photographer in his show-case of any portraits, unless he has obtained "the express permission" of his sitters, has been made a criminal offence in the German Fatherland, punishable by fine or imprisonment.

In coating gelatine plates which have a tendency to exhibit grease spots, Dr. Van Monckhoven advises the manipulation of the emulsion as cool as possible, to get the film as thick as may be. The cooler the emulsion, he says, the less chance is there of the formation of spots; and if it is of a concentrated nature, there is a lesser chance still of the vexatious phenomenon.

To facilitate the coating of plates with gelatine emulsion M. Andra recommends treating them first with a solution of sugar in water, instead of with a solution of soluble silicate, which appears to be popular in France. The trace of sugar, or silicate, left behind helps the emulsion to flow easily, even when in a thick and cool condition, and thus a thicker coating than ordinarily is applied; thick films, as everybody knows, being better than thin ones.

"I never sanction the unscrewing of any of my lenses," we heard Mr. Dallmeyer emphatically state the other day. "If it is pardonable under any circumstances, it is with the No. 1 wide-angle lens; the back combination being removed in this case, a very good view lens will result. But No. 1A, or AA, should never be touched, and, above all, I recommend photographers to let my portrait lenses alone; much mischief may arise from tampering with them."

Reviews.

LANTERN READINGS AND LANTERN SLIDES. (*F. York*, 87, *Lancaster Road*, *Notting Hill.*)

MR. YORK sends two more "Readings" recently added to his collection, the one scientific, the other humorous, viz., "Waves of Sound," edited by Professor S. P. Thompson, B.A., D.Sc., &c., and the other, "A Photographer's Perplexities," by Mr. Lewis Novra. There is no better way of passing a pleasant evening than with a good "Reading" and a well-selected series of lantern slides, and there is no one better than Mr. York who understands how to provide these things. His catalogue includes a whole world of wonders, and whether the taste of an audience inclines towards the archæological, mythical, biblical, historical, whimsical, sensible, or non-sensible, he is in a position to satisfy it out of hand, so varied and numerous is his store of beautiful slides. Anyone could turn showman, and earn the thanks of a Christmas party, provided with one of Mr. York's "Readings," and a series of transparencies proper to its illustration.

Topics of the Day.

ON THE APPLICATION OF PHOTOGRAPHY TO CHEMICAL RESEARCH.

BY W. N. HARTLEY, F.R.S.E., ETC.,
Professor of Chemistry, Royal College of Science for Ireland, Dublin.

IT is a fact now well known that the sun, and other sources of light, emit rays which are not visible to the same extent as the luminous rays, but which are capable of making visible impressions by their action on certain salts of silver, certain salts of iron, on gelatine and bichromate of potash, and various other substances capable of undergoing a chemical change. It is also a fact that these rays can, by special contrivances, be observed with the eye. Thus Helmholtz, by admitting a very pure spectrum into

a darkened room, and carefully shading off the red, orange, yellow, and other rays, as far as and including the violet, found a considerable spectrum beyond, which appeared of a lavender or lavender-grey tint. It is not every eye that would be able to discern this part of the spectrum, since the visual organs of different individuals vary much in their capacity for distinguishing different colours, and these rays are more difficult to see than those of a strong colour. One method, however, which was discovered by Professor Stokes, renders the obscure rays plainly visible. This consists in allowing them to fall upon a sheet of paper covered with a solution of quinine, or some such fluorescent body. Phosphate of uranium, freshly prepared, or uranium glass, answers very well. The rays lying beyond, that is to sa , more refrangible than the violet part of the spectrum, will be frequently mentioned as the ultra-violet rays, the chemical rays, the photographic rays, or the invisible rays, in allusion to their refrangibility or position in the order of colours of the spectrum, to their power of initiating energetic chemical changes, to their familiar action in the production of photographic images, and especially to their property of producing photographic representations of themselves.

In the year 1862, the late Dr. W. A. Miller, Professor of Chemistry in King's College, London, and likewise Professor Stokes, of Cambridge, investigated, independently of each other, and by different methods, the rays emitted by electric sparks passed between metallic points. They found that electric light consisted largely of rays of high refrangibility, which were easily absorbed by lenses and prisms of glass, and that the only material suitable for apparatus with which to observe the ultra-violet rays was quartz. The superior transparency of quartz over glass is such that a spectrum of the rays emitted by the metal silver can be photographed for a distance beyond the visible spectrum, amounting to six times its length. I shall describe some of the most important features of the apparatus made use of in such experiment, reserving, however, many of the details for a full description of the most improved form of instrument which I have latterly worked with until a future day.

The apparatus used in the investigation of photographic spectra may be divided into three parts:—1st, the electrical apparatus for producing the rays; 2nd, the spectroscope for decomposing the rays; 3rd, the photographic camera.

The electrical apparatus consists of an induction coil capable of giving a spark six or seven inches in length through air. This is excited by a battery of five Grove's cells. The secondary wires from the coil are conducted to a Leyden jar or other form of condenser capable of converting the long, thin, and only faintly luminous spark of the coil into one short, thick, and brilliant. The size of the jar most suitable for a coil of the dimensions mentioned would have a metallic coating, both outside and inside the jar, equal to seventy-two square inches. The size of the jar compared with the power of the coil is a very important matter, since if the jar be too large the passage of sparks is too intermittent, and when the working of the battery becomes less energetic, ceases altogether. Again, if the jar be too small, the spark is not sufficiently brilliant to give a short exposure, and again, the metallic lines in the spectrum are wanting in chemical action at their centres, because the heat has not been sufficient to carry highly ignited metallic vapour right across from one pole to another. The secondary wires from the coil are connected one with the interior, the other with exterior metallic coating. These metallic surfaces are then, by means of other wires, connected with the metallic electrodes the rays emitted by which it is desired to examine. The electrodes in most cases are with advantage shaped like thin longitudinal sections of a pear, the broad ends being placed opposite and near to each other, the best distance being about a quarter of an inch apart. The electrodes or metallic points are held by screw clips in insulated stands of ebonite. With the battery in good working order, fully charged, and all connections clear and bright, there is no difficulty in obtaining a rapid stream of sparks without interruption for a quarter of an hour, or even for a much longer period; thus, in some cases, the coil has been kept at work continuously for an hour and a half. A coil which has been in constant, almost daily, use for three years is now as good as ever, but the screw of the contact breaker has been renewed several times. Certain metals yield sparks with greater facility than others; thus cadmium is one of the best metals in this respect. In the case of nickel and iron, the best effect is gained, not by broad electrodes such as have been described above, but by points of wire.

The Spectroscope consists of a collimator tube, terminated at one end by a slit capable of being opened wide or made as narrow as the 1-500th of an inch, and closed at the other end by a 36-inch focus quartz lens. The length of the collimator tube is 36 inches; but it should have a telescope fitting so that its length may be accurately adjusted to the focal length of the lens. The rays passing through the collimator are received on a prism of quartz of perfect transparency and quite colourless. The prism is cut out of the quartz crystal in such a way that the axis of the former is at right angles to the axis of the latter, in order to avoid as far as possible the effect produced by double refraction. The angle of the prism is 60°, while its height may be about one inch. Behind the prism is another lens of quartz of 36-inch focal length, and this is screwed into the photographic camera. Here it may be noted that Dr. Miller used but one lens, namely, that behind the prism; but I have found an advantage in using the combination of two lenses.

The angle of refraction of the prism should be determined with a goniometer before it is fixed on to the stage attached to the photographic camera; and the collimator and camera should be adjusted to this angle, the prism occupying a position between the two parts of the apparatus. It is needless to say that as the lens has a focal length of 36 inches, the camera must be of considerable dimensions, and capable of being drawn out to this length. In order to gain some idea of whether the spectrum is properly focussed, a ground glass screen answers for the visible rays; but for the invisible or ultra-violet radiations the screen should be coated with gelatine containing a small quantity of æsculine in solution. The substance which is extracted from the horse-chesnut is powerfully fluorescent. The fluorescent spectrum is seen by making the line of vision at an angle to the surface of the glass.

The Photographic Process.—Dr. Miller's photographs were all taken upon wet plates, the collodion being a bromo-iodised variety, the developer being pyrogallic acid. Now, I have here to remark that this method is greatly disadvantageous, first, because the free nitrate of silver on a wet plate intercepts some of the active but more active refrangible rays; secondly, because the iodide of silver is not sensitive to about one-half of the spectrum, which lies beyond the violet; and, thirdly, because, unless the work be carried on in a large and well-ventilated room, the ozone produced by the electric discharge causes the plates to be fogged directly the developing solution is applied.

There are two processes which are eminently suitable for this work, and these are the collodion emulsion plates as prepared by the Rev. Canon Beechey, and the gelatino-bromide dry plates. Although, according to my experience, the most rapid gelatine plates have been those prepared with a certain proportion of iodide of silver in the film when used for portraiture and landscape work, yet, for reasons already stated, pure silver bromide alone should be incorporated in the gelatine, the silver iodide being less sensitive to the latter half of the spectrum which it is desired to obtain on the plates. For some of the weaker and more refrangible rays the Beechey plates appear to be more sensitive. The exposure of plates when

photographing with the slit of the spectroscope wide open is not more than two or three seconds; when photographing line spectra with a slit about 1-300th of an inch in width, under ordinary circumstances, the plate is exposed five to seven minutes; but in particular cases this period has been extended to as much as an hour and a-half.

The Development of the Plates.—In certain cases the alkaline developer containing pyrogallic acid is most suitable, and when it contains glycerine, and is made in the manner that has been recommended by Mr. Edwards, it answers the purpose best. The developer of Mr. Carey Lea made from ferrous oxalate is undoubtedly the most satisfactory and convenient in most cases, but for the executing of photographs of spectra containing very fine lines it is disadvantageous on two grounds: first, it requires the plates to be longer exposed; and second, the granular deposit of silver does not yield images with such exquisite delicacy of detail as are given by the glycerine delveloper.

In the year 1878 Mr. A. K. Huntington, who now holds the appointment of Professor of Metallurgy in King's College, London, very ably assisted me in that portion of the enquiry, an account of which has been published in the Philosophical Transactions of the Royal Society for 1879. We have since extended the investigation, and a paper by us has just appeared in the Proceedings of the Royal Society.

I propose now to give an account of the work accomplished by the late Dr. Miller, and likewise note the investigations of Professor Stokes and M. Soret, so that the point of departure of my own work from these may be made evident.

The "Topic" for next week will be "Posing the Sitter," by Lyddell Sawyer.

(To be continued.)

Correspondence.

SARONY VIGNETTES.

Dear Sir,—Allow me, as the printer and introducer of the vignettes you speak of in use at the printing establishment of Messrs. Sarony and Co., Scarborough, to add a remark to your article of November 5th, respecting your visit to that place. The vignette is cut out of stout cardboard (so that the damp may not alter the shape), as near as possible the size of the figure on the negative (not smaller); then two sets of holes are punched all round, the first about one-eighth of an inch from the edge, and the second row about half-an-inch from the edge, and about one inch apart; and if the negative is a thin one, before putting in the printing frame I put a piece of tracing-paper under it, which will make a great improvement to any weak negative.

Trusting you will deem this worthy of a place in your widely circulated journal,—I remain, yours truly,

A. W. Young.

THIN NEGATIVES AND INTENSIFICATION WITH MERCURY.

Sir,—I see in your article in the News this week on "Thin Gelatine Negatives" that mercury is spoken of as very unstable and liable to fade. This is, of course, a matter of importance to many of those who now use it for gel tine intensification.

There are, however, some who consider that the perfect working of the plate has much to do with the stability of the negative or transparency.

I should certainly be glad to know the experience of others (older photographers than myself) on this question; but I may say that I have now in my boxes negatives and transparencies more than ten years old whitened and intensified with mercury, some of which have faded to some extent, and others which are as good and brilliant as the day they were done.

I attribute the fading to imperfect washing. They have not been very much exposed to light, but have frequently been taken out and examined.

It is certainly an important matter to know whether mercury is safe to use as an intensifier with gelatine plates it is certainly a most effective aid in the making of good printing negatives.

I would add, respecting thin gelatine negatives, that I over-exposed one of Edwards' plates a few days ago, and developed it with glycerine pyrogallic into a thin worthless negative; but by the aid of a *re*-development with oxalate, mercury, and ammonia got a most vigorous printing negative.

This was only an additional proof of the value of oxalate combined with mercury and ammonia to make a good negative out of an utterly worthless over-exposed plate.

Francis W. Turton.

THE BRISTOL EXHIBITION.

Dear Sir,—As your readers will probably like to know who are the judges of the forthcoming International Photographic Exhibition in Bristol, I append the names:—A Royal Academician (whose name will appear next week), and J. Jackson Curnock, artists; Payne Jennings, W. H. Midwinter, and H. Radcliffe.—Yours faithfully,

H. A. H. Daniel, Hon. Sec.

PS.—Exhibitors will please make all P.O.O.'s payable at Queen's Road.

COLLODION *VERSUS* GELATINE.

Dear Sir,—A letter by the writer of the article "In and Out," in your News of the 5th inst., induces me to say that for the past eighteen months I have used nothing else but *commercial* gelatine plates in conjunction with a Ross' No. 2 cabinet lens and Cadett's shutter in my studio, and that on any ordinarily fine day I find that the quickest exposure I can give (estimated at about half a second) enables me to produce a better negative than a more prolonged exposure does. The good behaviour of a little child or a dog has frequently tempted me to give a little longer exposure (this being a result of the old wet-plate habit of getting all the exposure you could with these mobile subjects), and I have invariably found that a second negative of the same object taken at the same time, but without any appreciable holding up of the shutter, is by far and away the best. I enclose you two cabinet photographs, each taken with an exposure of not more than a second on a somewhat dull day, as evidence of the quality of my negatives.—I am, yours respectfully,

W. W. Kirk.

[The pictures we are favoured with leave nothing to be desired.—Ed. P. N.]

Sir,—Although there is nothing essential in the ten-time-fiction, yet, somehow, its iteration jars with no little energy on one who finds the so-called "instantaneous" plates only about a third quicker than his wet ones. So to clear the way, we might ask Mr. A. P. Chambers to condescend to particulars.

Suppose that gentleman coats a plate with a half-and-half mixture of Thomas' and Huggon's collodions, dips it into a thirty-five grain bath made with Johnston and Son's triple silver, and develops with the formula on Thomas' bottles (taking care that both bath and developer are at a suitable temperature), he will bungle a good deal if he cannot take a fully-exposed negative with three times the time he allows for an equally fully-exposed dry plate by one of the best known makers.—I am, &c., Transparent Highlight.

Proceedings of Societies.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE annual meeting of the above was held at the Museum, Queen's Road, on Tuesday, October 12th, Mr. T. DAVEY, one of the vice-presidents, in the chair.

The minutes having been confirmed,

The HON. SECRETARY stated that the first business was the election of a President in the room of their late lamented friend Mr. W. W. Stoddart, whose death last session had been so fully and feelingly noticed in both the technical journals. Amongst some of the members who had chatted the matter over, he believed a rather unanimous feeling existed in favour of their valued member, Colonel Biggs; he had seen him on the matter, and was warranted in saying he would be willing to accept the post. The Hon. Secretary, therefore, felt great pleasure in proposing Colonel Biggs for the Presidentship of the Association.

The CHAIRMAN seconded the proposition, and had great pleasure in doing so, as there could be but one opinion as to the acquisition Colonel Biggs would be as President.

Col. BIGGS was then unanimously elected President for the ensuing year.

The HON. SECRETARY then read the following report for the past session:—

In again presenting the Annual Report, the Council does so with much pleasure. The past session has been quite up to the average in the election of new members, and the Society has considerably augmented its strength.

The following papers and communications have been contributed by various members:—"Notes on Gas-holders and Lantern Apparatus," by H. A. H. Daniel; "Notes on Stereoscopic Photography," by E. G. Powell; "Are Gelatine Plates Suitable for Landscape Photography?" by H. Manfield; "Vitro-Enamels," by H. N. White.

The monthly meetings have greatly improved in the matter of attendance, which the Council considers a matter of congratulation. The same improvement has been evident at the outdoor meetings, the result being that they have been more successful.

The Council would draw the attention of the Association to the International Exhibition to be held at the Academy of Arts, in December next, and which was decided upon at the last annual meeting, after considerable discussion, on the motion of Mr. Daniel, seconded by Mr. Brightman.

The financial position of the Association is satisfactory.

The Council, in conclusion, sincerely hope that every member will keep the best interests of the Association at heart, and willingly take any little trouble necessary in handing to the Hon. Secretary the addresses of any amateurs desirous of joining the Association.

The best thanks of the Council are due to those who have kindly contributed papers, &c., at the monthly meetings.

The CHAIRMAN said he thought they must consider the report very satisfactory in every respect.

Mr. MUNROE perfectly agreed with the Chairman, and begged to propose the adoption of the report.

Mr. E. BRIGHTMAN seconded the motion, which was carried.

The HON. SECRETARY desired to draw the attention of the meeting to the subject of appointment of judges for the forthcoming International Exhibition, for although much of the future arrangements would be carried out by the Council, still it was necessary that the present meeting should know what was intended. The names of certain well-known amateur and professional photographers and artists being discussed, five were ultimately decided upon. As to the Exhibition itself, it was decided that it should be opened with an evening conversazione by the Mayor of the City and County of Bristol, and to which Exhibition their friends would be invited, and the public admitted by ticket; also that the entrance charge should be one shilling till five o'clock, and sixpence afterwards; the price for a season-ticket being half-a-crown.

After some further discussion on various matters, the meeting closed.

THE last out-door meeting of the above Association took place at Tintern. Arrangements were made for the assemblage to take place at Clifton Down station. At the appointed time one of the vice-presidents and several of the members met, but were astonished at the absence of the Hon. Secretary; and when the time for the starting of the train arrived, he had not put in an appearance. It was thought that probably he would endeavour to intercept the train at Stapleton Road Junction, and, sure enough, just in time—breathless, breakfastless (almost at boiling point), and in far from a dignified manner—the Hon. Secretary shot out from a cab, and, followed by another member, came bowling into the station "like a cartload of bricks." He had missed his breakfast, and the train at Clifton Down, all through over-sleeping Moral: *Never over-sleep*. However, "all's well that ends well.' The party being now complete, a most enjoyable trip was taken to Tintern, the train now most conveniently running direct to this village. The Severn ferry makes, in the summer, a most pleasant variety to the journey, the three miles' run by steamer being very refreshing. This all the members found to be so, especially the Hon. Secretary and another member, who were achieving wonderful results with the ham, coffee, &c., down in the saloon. Having arrived at the village of the ever-beautiful Abbey (said by many to surpass all others in the Kingdom), the many dry and wet "traps" were unlimbered, and work began in real earnest.

The inside of the Abbey first claimed attention, and the numerous beautiful architectural subjects, including the fine perspective view of the nave and chancel, the massive transept and galleries, interesting studies of the refectory. dining room, and other portions, were diligently sought out and made pictures of; for anyone with the slightest pretence to artistic conception and perception would find little difficulty in exposing a plate in any. part of this most grand old ruin, and would make a picture Among the other notable features of this beautiful Abbey, the West window was greatly admired, not only for its masterly and chaste design, but for its marvellously perfect state of preservation.

Some of the charming pictures which the exterior of Tintern Abbey makes with the surrounding hills and rich verdure were next made objects for the camera, plates ranging from 7 by 5 to 10 by 8 being employed.

A move was then made for the Beaufort Arms Hotel, where all did most conscientious justice to a capital meat tea, provided in the style for which this most comfortable and cosy hostelry is famed.

All apparatus having been packed up, and stowed, with the owners thereof, into the brake, the station was reached and the homeward journey commenced.

The sundry formal matters of business, minutes, &c., having received attention, Mr. H. A. H. Daniel said he felt the meeting could not conclude without a mention of the loss the Association had sustained in the death of its president, Mr. W. Walter Stoddart, F.C.S., F.G.S., one who was as learned and accomplished as he was modest; ready to assist, or to contribute a paper always, &c., if his time permitted. He would not say more, as in a former number of the Association's Journal a most extended reference to the sad event had been made; and a proposal that a vote of condolence be sent to Mrs. Stoddart was carried.

Mr. T. DAVEY (a vice-president) said he could but re-echo Mr. Daniel's remarks; he knew how every member valued Mr. Stoddart, and desired to second the proposal of the last speaker, who, he thought, as Hon. Secretary, should be left to draw up such an expression to Mrs. Stoddart; he was quite sure Mr. Daniel would do it in a manner satisfactory to all.

Cigars, anecdotes, and general chat then concluded what all felt to have been a most pleasant day. The weather was all that could be desired. A good number of plates were exposed (chiefly dry), and no mishap (save a broken focussing-screen, which a *thin* gelatine plate easily replaced) occurred.

PHOTOGRAPHIC SOCIETY OF IRELAND.

THE second annual meeting of this Society was held on the 12th inst. in the Royal College of Science, Stephen's Green, Dublin, Mr. J. E. MADDEN in the chair.

The HON. SECRETARY read the report for the Council as follows:—

In presenting their Report for the past year, the Council have much pleasure in announcing the prosperous condition of the Society; the financial position cannot but be considered satisfactory, a fact which is principally due to the present favourable arrangements for meetings which the liberality of the Science and Art Department has made possible.

The meetings have, on the whole, been well attended, and

it is to be presumed fairly interesting; and it is expected that during the coming months several interesting papers will be read and discussed.

It is proposed to continue the issue of one or more presentation prints, and the Council feel that the thanks of the Society are due to Mr. George Mansfield for the use of his negatives for the one which has already been circulated.

The lantern exhibition having been so generally approved of, it, as well as the out-door meeting, will be repeated.

The Treasurer, Mr. J. R. Fleming, owing to the uncertain state of his health, has felt himself called upon to resign, and the Council desire to express their regret that this necessity should have arisen.

The following abridged balance sheet shows the income and expenditure of the past year.

To Subscriptions received	£26	10	0	By Rent for 1879	£3	0	0
,, Balance from last year	5	11	2	,, Printing	3	7	7
				,, Postages	1	11	0
				,, Attendants	1	15	6
				,, Presentation Prints ...	3	15	0
				,, Expenses of Lantern Evening and Out-door Meeting ...	2	10	8
				,, Sundries	0	16	3
				,, Balance to meet act....	15	5	2
	£32	1	2		£32	1	2

Proposed by Dr. Croswaithe, and seconded by Mr. Thomas Mayne, T. C., "That report and statement of accounts be received and adopted." Carried unanimously.

The following officers were then elected for the ensuing year.

President—Dr. J. Emmerson Reynolds, F.R.S.

Vice-President—Howard Grubb, F.R.A.S.

Treasurer—Thomas Arthur Bewley, 14, Booterstown Avenue.

Council—Professor Barrett, F.R.C.S.E., Dr. Charles, R. C. Tichborne, I. E. Madden, Thomas Mayne, T. C., W. E. Wilson, John V. Robinson, Samuel Hunter, F.R.A.S., Joseph Woodworth, Arthur Mayne, R.H.A., Alexander Conen.

Honorary Secretary—Alexander Conen, Roseneath, Sandymount Avenue, Dublin.

A ballot having been taken, the following gentlemen were declared elected members of the Society:—Greenwood Pim, J. H. Smith, Thomas Tomlison, E. P. Johnstone. Two new members were proposed for election at the next meeting.

Professor Hartley exhibited a collection of photographs lately taken by him, also carbon enlargements of some of them.

Mr. Joseph Woodworth exhibited a novel camera of his own construction, and explained its principal features.

A discussion as to enlarging by means of the optical lantern brought the meeting to a close.

Photographers' Benevolent Association.

On Thursday evening, 11th inst., the Exhibition of the Photographic Society of Great Britain was open in support of the Benevolent Association.

The Gallery presented a very animated appearance, the attendance being exceedingly good, nearly two hundred and fifty visitors having passed the barrier. Great interest was manifested in the display of pictures.

The Association was established in the year 1873, its object being to organize the charitable sympathies of the profession, and thereby to afford temporary or permanent assistance to those members, their widows or children, who, through sickness, death, or want of employment, may be in pecuniary difficulties, by making immediate grants of money, by pensions to aged members, and by aiding the unemployed members in obtaining situations.

The office of the Association is at 181, Aldersgate Street, where the Secretary would be pleased to receive any donations, enrol members, or give any information regarding the Association. The Board meet at eight o'clock p.m. on the first Wednesday in every month.

Talk in the Studio.

Masks and Discs.—Messrs. G. Mann and Co. have forwarded us some samples of black—or, rather, dark stone-coloured—paper, suitable for mask-printing. The difficulty has always been to get paper for this purpose even in texture and perfectly opaque, and, of course, quite free from pinholes. These qualities, the material of Messrs. Mann appears to possess in a high degree, and it has, moreover, the advantage that the paper does not part with any of its colouring matter in use.

Christmas Cards.—Messrs. Mansell and Co. send us some pretty photographic cards, coloured and uncoloured. The portraits of "Pussy" we like best; but the "Pair of Wrens," which are made the bearers of "Good Tidings," will doubtless find many admirers.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Account."*

*** We regret that the length of our "At Home" this week has compelled the postponement of "In and Out of the Studio."

W. L.—Thank you. We shall publish your communication.

S. J.—We consider the specimens are excellent; you should have sent them to the recent Exhibition.

F. J. P.—Yes. You will find your box quite water-tight; a little boiled oil is sometimes added to the shellac.

Novice.—You certainly have much to learn, but some of the prints sent are fairly good, and we admire your perseverance.

S. Hope.—Certainly not.

Query.—We must refer you to the best lens makers, whose names will be found in our advertising columns.

R. F.—We must plead press of matter; we have read your article, and will insert it as soon as ever we can find space for it.

K. S. A.—The parcel was already despatched when your letter arrived; kindly say at once if not received.

Photo.—The cause is a good one, and we wish you every success.

W. J. Houlson.—Apply to Mr. Knott, optician, Elliott Street, Liverpool.

F. Dakin.—We are glad to hear of your success. Our diffidence arose from a fear the gelatine might colour the cards a little. The gelatine should be a slight protection to the print, if anything.

D. W.—A little alum will at once do what you desire; you might employ a saturated solution in cold water.

Otto.—It converts the silver into iodide of silver, and iodide is readily soluble in a solution of hyposulphite of soda.

Brighton.—It is precisely the same thing.

Contretemps.—The fumes aid in the reduction of the silver; hence the yellowing or browning. We do not know whether ammonio-nitrate is yellow, but think it is hardly likely. As it is impossible to say how the ready-made sensitised paper you speak of has been prepared, we cannot follow the reactions.

Hypo.—Many papers get yellow after twenty-four hours, but should not do so before. Keep in a dry dark place after sensitizing. A little sugar added to bath sometimes cures yellowness. You may get your paper to keep for weeks if you blot or wash after sensitising; but then you must fume the printing pad with ammonia when printing.

H. J. B.—They may arise, unfortunately, from several causes. Possibly you do not leave the plate in the bath sufficiently long; also try filtering your bath.

Job.—Our advice under the circumstances is not to send the money.

G. G.—1. Yes; the same firm, no doubt. 2. Marine glue is best and cheapest for such waterproof joints; a liquid is sold for diluting it.

Heliogravure.—Long before then; Nicephore Niepce elaborated a process in 1825.

Tyro.—Not always; it may be a sulphide, although in the circumstances this is unlikely.

Byron.—Both gentlemen were exhibitors. The lady died some little time ago at Ceylon.

J. F. N.—1. Yes, and you will have no difficulty in clearing with hyposulphite or cyanide. Another method is to make your transparencies with carbon tissue; the Autotype Company would supply you with simple instructions. There is an article on the subject in the last Year-Book, and a leader to-day.

Sticker.—The method does not answer so well for highly-glazed cards; it is only intended for ordinary mounts. But try moistening print alone with sponge.

One in the West.—We hope to satisfy you shortly, but in the meantime you will find much respecting the process in "Instruction in Photography," by Capt. Abney, to be had from our publishers. If you desire one of the German handbooks, they also could procure it if you asked them.

Inquirer.—May we ask you to repeat the other substance (not the ferrous oxalate), as it is not quite clear in your note? We shall then be happy to send you the information you ask for.

John Patrick.—If we cannot do all you want, we hope to give some valuable details, at any rate.

Querist and O. A. M.—Next week.

C. E. Wyrall.—Thank you.

C. J. Emering.—Your idea is a radical one, but in certain circumstances it might present advantages. But it would be necessary to take precautions not to shake the camera unduly, and we fear the spring would do this.

The Photographic News, November 26, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Solar Photography and the Photophone—Photographic Reproductions—Sarah Bernhardt and her Photographs—The Sun's Spots and Politics—How to Secure a Good Expression.

Solar Photography and the Photophone.—Professor Bell's latest discovery, the Photophone, promises to be capable of yet further wonders. Professor Bell lately visited M. Janssen's solar observatory at Meudon, and was much struck with the solar photographs which are the French astronomer's speciality. He expressed the opinion that the variations of brightness of a given solar point might make the photophone speak, and so reproduce in the laboratory sounds produced on the sun. M. Janssen placed his instruments at Professor Bell's disposal, and on a fine day the experiment was made, but without distinct success. M. Janssen has proposed that a series of successive photographs of a particular point on the sun's surface be passed rapidly before an objective giving images on the selenium apparatus, so condensing into a brief space variations which in the solar images are too slow to produce sound in the photophone. If this be successful the "music of the spheres" may be literally realised! At all events, the result of some preliminary experiments is stated by M. Janssen to be hopeful, in his notice brought before the Academy of Science on the 2nd of November.

Photographic Reproductions.—An important adjunct has been made to the Bibliothèque Nationale in the *Rue de Richelieu*, Paris. A spacious photographic studio has been erected, in which reproductions of the rare stamps and curious designs which the library contains will be made. It will also be utilized for reproducing ancient manuscripts, the duplicates of which will be distributed in the various depositories throughout the country, and so avoid, in case of fire, the entire destruction of relics of the past whose loss would be absolutely irreparable. The studio is placed at the top of the building, and is about eighteen metres long and about seven wide. The dark room is situated in one corner of the studio, which is constructed entirely of glass and iron. This is an example which might well be followed by our Government. The reproduction of old documents is carried on to a large extent by the Ordnance Department at Southampton; but the work here, extensive as it is, represents but a very small portion of that necessary to be done. At the Record Office and the British Museum must be vast stores of manuscripts of historical value, which, if once lost, could never be replaced. At the British Museum there is some apology for a photographic studio, but connected with the Record Office nothing of the kind is to be found.

Sarah Bernhardt and her Photographs.—Mdlle. Sarah Bernhardt has a very keen appreciation of the value of photography. On arriving at New York she was waited upon by Mr. Sarony, who offered her 1,000 dollars for the exclusive privilege of photographing her. Mdlle Bernhardt thought the sum too low, and modestly demanded 5,000, to which the New York photographer naturally demurred. Eventually the actress came down, and accepted Mr. Sarony's offer, which must certainly be considered a most liberal one. Already Mdlle. Bernhardt has sat ten times, and anticipates going through the ordeal thirty times more. In the opinion of many people, who have a horror —or pretend they have—of sitting for their portraits, she will at this rate have earned her money. We shall be rather curious to see those new portraits of the "incomparable Sarah." Those exhibited in the shop-windows of London have certainly not done her justice. With a face so mobile and emotional, Mdlle. Bernhardt is by no means a favourable subject for the camera; and those persons who have only seen her photograph must marvel greatly at the enthusiastic descriptions of the actress given by the New York papers. According to the infatuated writers, there is assuredly no truth in the ill-natured remark of Dumas, who said of a picture of Mdlle. Bernhardt and her dog, that it was the picture of a dog looking at a bone!

The Sun's Spots and Politics.—Professor Piazzi Smyth, the Scottish Astronomer-Royal, is said to have made an important discovery: nothing less than that the attentive observation of the sun's spots on the part of our rulers would lead them into good government. The sun, it would appear, is extremely interested in the Irish question, for we read in the current number of the *Astronomical Register* "that the sun, in his never-ceasing cycles of radiant heat, light, magnetism, and spots, with their necessarily accompanying tenth or twelfth bad agricultural year, *fights against the Irish Land League.*" An F.R.A.S., writing in a contemporary, amused with this notion, suggests "that a really formidable rival publication to *Zadkiel's Almanack* (on strictly sun-spot principles) might be brought out specially for circulation in Ireland. Here are a few of his suggestions. "One spot and a few small faculæ on sun's disc would indicate an agent dangerously wounded, and two process-servers beaten to a jelly. Neither Mr. Foster nor the constabulary on the spot." "Sun absolutely free from spots," would mean "three landlords shot dead, an agent fired at; everyone put in as care-taker in Mayo pitchforked." "A group of spots appearing on the sun's following limb signifies one landlord ineffectually fired at. Several tenants spontaneously pay their rents." This is not a bad notion. If the sun really desires to act as the guide, philosopher, and friend of the English Government, no time should be lost in the interpretation of his variations. The only question which exercises our mind is: might not the presence and absence of the sun's spots be just as applicable to the difficulties in the French Chamber, the solution of the Eastern question, or the suppression of the Nihilsts? What is there to indicate that the sun cares only for Ireland?

How to Secure a Good Expression.—We presume that the days are past when a photographer thought he had done his duty and his sitter justice, after moving about the studio silently and mysteriously, and fidgetting about the head until the "subject" was not quite sure it belonged to him, to blandly tell him to "look pleasant;" or, if the subject were a lady, to bid her, off-hand, put on a smile. A few fossilised specimens, we are afraid, still remain, and to them we recommend the following, which the *New York Daily Graphic* relates: "A decently-dressed workman came to a photographer's recently to have the portrait of his wife taken. While the operator was arranging the camera the husband thought fit to give some advice concerning her pose. 'Think of something serious,' he said, 'or else you will laugh and spoil it. Remember that your father is in prison, and that your brother has had to compound with his creditors; and try to imagine what would have become of you if I had not taken pity upon you." We are not at all sure that an observation of this kind from the photographer would not be more efficacious in securing a lively expression than the stereotyped request to "smile, and look pleasant."

At Home.

MR. WALTER WOODBURY AT MANOR HOUSE, SOUTH NORWOOD.

If we divide the history of photography into two periods, that which preceded collodion upon glass, and that which has followed it, we shall find in the second era no name more prominent than that of Mr. Walter Woodbury. Woodburytype, to the modern photographer, is as "familiar in his mouth as household words," and is, and apparently will be, for many years to come, the only photo-engraving process of practical and commercial value. What a fortunate idea to light upon, many have thought in becoming

acquainted with Woodburytype for the first time, and how lucky Mr. Woodbury was to have conceived it; few consider the matter seriously, and dream that there has been tedious experimenting and elaborate labours preceding the work.

Mr. Woodbury appears to have never been without a camera since he was old enough to carry one. Articled to a civil engineer, he had barely served his time, than he went off to Australia, when thirty years ago the popular tide set in that direction. Like Moses with the green spectacles, he forthwith purchased a camera with his available cash—about the most useless thing he could possibly buy, without chemicals and other necessaries for the taking of photographs. However, the latter were afterwards acquired, when Mr. Woodbury had suffered some of those vicissitudes which the bard tells us "acquaint a man with strange bed fellows." Indeed, so successful was he with his camera, when once firmly on his feet, that in 1854 the prize medal was awarded to him for photography in the Australian Colonies.

Quitting Australia, we find Mr. Woodbury in 1857 and 1858 in Java, taking pictures for the Sultan, and to prove how well these were executed we have but to refer the reader to the charming trausparencies of scenery iu the Tropics, published in 1859 by Negretti and Zambra. We were looking at a series the other day of these glass stereoscopic slides, the photographs printed upon albumen, and we fearlessly assert that nothing of the kind which has been produced in recent years excels the delightful pictures of luxuriant foliage and eastern vegetation which Mr. Woodbury produced nearly a quarter of a century ago.

What is this curious little picture Mr. Woodbury brings to us? It is in a tiny frame, and represents a table decked with fruit and flowers, coloured vases, and gilded ornaments. It is a photograph, and yet it is resplendent in colours. Mr. Woodbury laughingly strips off the backing, and then we find it is a Woodbury transparency on glass, with a roughly-coloured ground beneath. It was made in 1868, and represents one of the earliest examples of this kind of work—a photographic image over a coloured groundwork—which, from that day to this, has been brought before the public under one name and the other. The French patented process, of which we have heard so much lately, about *photographies des couleurs impressionées par la lumière*, is, of course, simply one example the more of this old dodge.

But we must come to the present day. Mr. Woodbury has plenty to show us, and here at Manor House he has laboratory and workshops full of interesting matters. This oblong little box standing on end, about fourteen inches high, and six inches broad, is Mr. Woodbury's balloon apparatus. It is not difficult to explain. It is carried into the air by a small balloon, which is tethered to the ground by an electric wire. It hangs down from the balloon exactly in the position in which we see it standing upright on the table. The lens is uncapped at will by a revolving disc, which revolves once every time the operator sends an electric current from below. He sees when the balloon has done gyrating, and between the turns makes his exposure. He can make four exposures at every ascent of the balloon, for he has four plates. These four plates are fixed to four faces of a cube, and this cube also makes one quarter turn (bringing another face, or plate, into position) whenever the operator sends an electric current up to the balloon from the earth. The system has the double advantage that only a small balloon is necessary, and that no risk is incurred by an aeronaut; for according to recent experience, there seems to be no difficulty about bringing down a war balloon if you can get a cannon within two thousand yards of it.

"What a capital workshop you have here!" we say; it is divided into four compartments for workmen, a broad passage running along at right angles to the divisions. "It is a very useful one," says our host, and then he adds, briefly, "I made it out of a four-stalled stable." And so he had; verily Mr. Woodbury is an inventor to some purpose.

Mr. Woodbury took out his patent for Woodburytype in 1864, but he no longer practises it in its original form; the process is now reduced to a very simple matter, Mr. Woodbury proceeds to show us. As our readers know very well, this modified process has already appeared in these columns, and what we are about to describe is therefore nothing new. Indeed, we have no doubt that anybody interested in the subject would be quite as welcome to witness the simplified process as we were. Seeing is believing, however, and it was for this reason that we begged Mr. Woodbury to receive us.

Imprimis, Mr. Woodbury takes a piece of carbon tissue and prints a picture upon it. This picture he develops upon a piece of glass—patent plate glass. He has now, therefore, to all intents and purposes a carbon transparency, which every carbon printer knows how to produce. This carbon transparency, still on glass, is, when dry, rubbed over with a little pomatum, and then a sheet of tin-foil put upon it. The two are now run through a small rolling press, such as every photographer possesses, with the result, of course, that the tin-foil is pressed into the carbon print.

The carbon print, with its facing of tin-foil, is next carefully put into an electrotyping bath, where it is left for some hours. Copper deposits itself all over the tin-foil, and when the plate is raised from the bath, instead of presenting a shining silver surface, it is covered with beautiful red copper.

Now for the next step. A thick slab of glass covered with resin is put upon an oven or water-bath to warm. The resin melts so that the top surface is adhesive. Under these circumstances, we take the electrotyped plate and press the copper surface firmly upon the resined glass. The whole is now cooled, and there remains attached to the glass block the copper and the tin-foil; the carbon transparency comes away. You see the sheet of tin-foil now, and find it has taken a cast of the carbon transparency, and this cast or mould, backed up by the copper and the resined plate, represents the printing block. From this printing block prints may then be taken in transparent ink, in the ordinary well-known manner.

The carbon transparency which comes away so easily, thanks to its treatmant with a little pomatum, may be used again and again for the preparation of printing-blocks, so that a dozen may be made, if necessary, without difficulty. No special apparatus whatever is necessary except the actual printing-press (which is a very simple matter), and a battery. Provided with these, any photographer might begin Woodbury printing to morrow.

An ingenious little apparatus which Mr. Woodbury has to aid him in his work deserves description. It is a veritable multum in parvo. It is a small iron casting, measuring about twelve inches, and its framework represents a levelling stand. Place over it an iron plate, and below a spirit lamp, and it yields a hot plate for coating the glass block with resin. Put upon the iron plate a little oblong vessel filled with water, and there is at hand a water-bath, useful for melting the resin (a lower temperature being now necessary), to effect the adhesion of the electro plate; again, this little water-bath may be removed, and a deep upright vessel substituted, also to contain warm water, but with a grooved interior, employed for the development of the carbon prints.

Paris, it seems, has been taking up the modified Woodbury process very warmly; so little apparatus is required, and the manipulations have been so much simplified, that the photographer has it in his own hands now to multiply impressions, and print them by photo-engraving. Hutinet and Lamy, of Paris, are occupying themselves with the manufacture of the carbon tissue, &c., and photographers of high rank—like Nadar, and others—are seriously setting to work to print in Woodburytype instead of silver.

About the preparation of the printing ink, in respect to which a good deal of mystery has been made, we may mention that it is but gelatine and water with any colour added,

such as Indian ink, or alizarine; in summer one-fifth to one-sixth gelatine to water, in winter more water. The ink is kept warm in the water-bath we have spoken of.

Lastly, here is the filigrain process. "I call this the cheapest photographic image ever made," says Mr. Woodbury; he takes a carbon print developed on paper, hard and dry, of course, and sends it through the little rolling-press, in company with a sheet of plain paper. The consequence is that when the latter comes out, it has a water-mark of the same design as the carbon print with which it has been pressed in contact. Any design may be thus impressed. Here are visiting-cards with the portrait of the visitor to be seen if you hold them up to the light; writing-paper with all sorts of fancy designs; trade-marks, labels, &c. Filigrain, if it is the simplest, is also the most fascinating of Woodburytype applications.

The "At Home" next week will be, "Brighton in the Season."

NOTES ON THE GELATINE PROCESS.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.*

I HAVE not seen the following observation in print, nor, as far as I know, has it been investigated, so I have thought it worthy the attention of the Society. When my gelatine emulsion is prepared I invariably coat two or three small plates, and allow them to dry, and try them to see what qualities the emulsion possesses. In every case I have found the trial plates slower and less dense than plates which have been prepared the next day. I consulted Mr. England about the matter, and he informed me that he found the same thing with his emulsions. Now, till lately, I laid this down to the fact that, in the one case, the drying of the plates was slower than in the other; thus the small plates would dry quicker in the drying cupboard, since the air must remain moister where a large number of plates are collected in the same space. Since my return from abroad I have, however, made fairly exhaustive experiments in regard to this subject, and find that drying has nothing to do with the matter. About ten batches of emulsion have been prepared and submitted to testing by that very useful instrument, Warnerke's sensitometer, and also by taking transparencies from a standard negative. I tabulate some of the results :—

	Sensitiveness.		
	1st day.	2nd day.	3rd day.
No. 150 Emulsion	1 ...	2·3 ...	3·00
No. 151 "	1 ...	1·7 ...	2·7
No. 152 "	1 ...	2·3 ...	3·00
No. 153 "	1 ...	3·0 ...	3·00
No. 154 "	1 ...	2·3 ...	3·00

So I might go on and recapitulate all my experiments; but this will show what degree of extra sensitiveness is imparted by keeping an emulsion. It has been suggested that this sensitiveness is gained through heating the emulsion twice or three times, to dissolve it; but this is not an explanation. Separate portions of the emulsion were kept undissolved, often for different periods, and then dissolved. The plates showed a similar gain in sensitiveness as when the emulsion was warmed up, day after day. The question arises, then, What is the cause of this? I am not at present able to answer the query, but shall endeavour to do so. In connection with this subject, I should be wrong not to allude to a negative shown me by a member of our Society, Mr. Stenning, some months ago. One-half was coated immediately after the emulsion was prepared, and the other half coated, I think, ten or twelve days afterwards. The half of the plate coated with the emulsion when freshly prepared was neither so dense nor so fully-exposed as that coated later. I never gave a thought to the matter at the time, but now it is full of significance.

Another point to which I would call attention is the fact that no plates that frill should be rejected. In July of this year I prepared a batch of some three dozen plates, and the weather being warm, I suppose the gelatine, to a certain degree, became decomposed, and the plates frilled viciously, and when coated with collodion blistered. The plates were put away till a few days ago, and tried. The film now is hard and tenacious, and when washed in water, and developed with developer at 75°, are equally good. The film is prepared with a trace of chrome alum, which may be one of the causes of the cure for the evil, since keeping a gelatine film in contact with such a trace does render it insoluble and impervious. How badly the gelatine was decomposed may be judged of when I say that the plates, after fixing, are dry in less than ten minutes. Some commercial plates which I had eighteen months ago, and which were at the time incorrigible "frillers," saw the error of their ways after being kept in confinement for some six months. This observation is not new—at all events, I have heard it or read of it—but I thought it might not be amiss to recall it to the notice of the Society.

Still another point to which I would direct you attention is, that in the development with ferrous oxalate, a judicious mixture of a few drops of hyposulphite of soda will often bring out an image full of detail when a plate is apparently under-exposed. I must, however, warn my readers against supposing that any plate is amenable to this treatment. When the plate is composed of silver bromide alone, or silver bromide and chloride, the effect of adding hyposulphite may be to cause a reversal of the image. When silver iodide enters into the composition of the emulsion, then the plan may be effective. I say *may be*, because I know that with some persons the addition has not been noticed to bring out more detail than they have had before on a plate.* Also I may remark that my experiments were made with the ferrous oxalate, *not* made from two solutions (which is wrongly called Eder's developer), and also that the plates had a glossy surface, and not a matt surface. With such plates I have no hesitation in saying that the exposure required when the hyposulphite was used was at least one-third that required when it was omitted. This is how the observation arose. In developing a plate, which seemed decidedly under-exposed, with ferrous oxalate, I happened to touch a bubble over the image with my finger, and where my finger touched, an image full of detail sprang out. Every effect must have a cause, and the cause was hyposulphite with which my fingers had been previously in contact. The addition of a few drops to the developer gave an image full of detail.

Other experiments confirmed the value of this addition. I would ask the members to try it and report. I find the hyposulphite is best added *after* the film has been impregnated with the developer.

One word more and I have done, and I dare say what I shall say now may be no novelty; but I would venture to recommend the method of intensification for gelatine plates which I have already printed in my book on the practical working of the gelatine process. Quite recently I have enlarged my experience with it, and can conscientiously say that it has not failed me once of late, which I lay to the fact that I am using peroxide of hydrogen which is fresher than that which I used before. It comes to this: after fixing your plate, wash it for half-an-hour in fresh water, changing every ten minutes, and then add 2 drachms of a 10 volume solution of peroxide of hydrogen to about 8 ounces of water, and let the plates soak in this for half-an-hour; wash again for five minutes, and then intensify with pyrogallic acid and silver—

No. 1.	Pyrogallic acid	2 grains
	Citric acid	2 "
	Water	1 ounce
No. 2.	Silver nitrate	20 grains
	Water	1 ounce

Add about half a drachm of No. 2 to every 2 ounces of No. 1, and intensify in a dish till proper intensity is reached. Negatives which gave only a phantom image I have intensified to good printing density, and without a stain or blemish of any sort. I shall be glad to demonstrate the proceeding, if thought advisable, at any of our meetings. I may say that I now prefer pyrogallic acid intensifier to ferrous sulphate and citric acid. I recommend that intensification should take place either in the dark room or a room weakly lighted with white light; a bright light is apt to cause mischief. Gelatine plates with matt surfaces seem to take both intensity and also development more kindly than to those with glossy surfaces, and my aim now is always to prepare plates in that condition.

I have ventured to bring forward these observations on the first evening of the session, as it is a night on which no discussion is advisable, and I believe that none can arise on the subjects I have introduced.

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* Read before the Photographic Society of Great Britain.

* From what I have since heard, the plates were fully-exposed, hence no benefit would arise from the addition of the hyposulphite.

ON A NEW METHOD OF OBTAINING "GRAIN" IN PHOTO-ENGRAVING.

BY MAJOR J. WATERHOUSE, BENGAL STAFF CORPS
(*Assistant Surveyor-General of India*).*

It is well known that in any process ot photographic engraving in half-tints it is necessary to produce what is technically termed a "grain," so as to obtain an ink-holding surface and give detail in the shadows; and to do this, the uniform photographic gradation must be broken up into a series of dots, points, or other small masses, which should be proportionally larger in the shadows than in the lights. Various methods of producing such "grain" have, from time to time, been proposed; but if produced by artificial means, such as ruled or stippled tints, woven tissues, &c., or by mixing granular material with the pigment in preparing the tissue, they have, as a rule, been too uniform, or, if dependent ou the natural grain of gelatine produced under certain conditions, they are very uncertain in their action, and easily affected by changes of temperature and other circumstances incidental to working with gelatine and the bichromates.

The process I employ is a modification of that described by Geymet in his "*Traite de la Gravure Heliographique*," in which the printing plates are obtained by the electro deposition of copper upon gelatine reliefs produced by the carbon process and transferred on silver copper plates; and in an account ot it I published two years ago, an alcoholic solution of tannin was recommended as useful iu producing the required grain. I found, however, that this solution was very uncertain in its action on different kinds of pigment tissues. Mr. Sawyer, of the Autotype Company, was good enough to make me some special tissues for trial in India last year; but the results were not altogether satisfactory. Hearing that I was about to come home, he very kindly offered me the use of his laboratory and the appliances of the large establishment under his direction to experiment further in the process—a most liberal offer, of which I have been very glad to avail myself.

My experiments have been chiefly directed to the question of "grain," and my first efforts were, of course, to obtaiu my old grain with the alcoholic solution of tannin; but I was somewhat surprised to find that instead of giviug me a grained surface, it in some cases seemed to give an extra smoothness and polish to the reliefs, making them look as if they had been enamelled. Alcohol, which had been recommended to me by Mr. Woodbury and others, as equally efficient with tannin in producing grain, also seemed very irregular in its action, and not to be depended on to produce the desired effect.

It was thus evident that neither an alcoholic solution of tannin nor alcohol itself had the power ot producing "grain," unless there were some predisposing cause present in the gelatine itself, such as would induce a tendency to "reticulation" in a more or less modified form.

The next step was to try to ascertain the conditions under which this tendency was produced, and our inquiries soon resulted in finding that "high temperature" was the primary cause. By merely raising the temperature of the water used for transferring the carbon prints for the reliefs to 70° or 80° F.—the ordinary temperature of water for many months in Calcutta—reticulation was at once brought about iu tissues that otherwise were perfectly free from it; and this no doubt gives the key to the differences I found in working in Calcutta and London.

The "grain" given by reticulation is, however, not quite what is wanted in the process, because, although it is undoubtedly stronger in the shadows than in the lights, and breaks the image well up, it has the disadvantage of destroying the relief and giving a flat toneless print. It seemed, therefore, undesirable to pursue the question of natural grain any further in the way of producing reticulation.

At this stage the idea suddenly struck me to try whether the required grain could not be produced by squeegeeing down sand or glass-paper, emery-cloth, or some similar material (previously waxed to ensure its after removal) into the reliefs while wet. The contraction of the paper while drying would force the granular substance iuto the relief more strongly in the shadows where there was a thick layer of gelatine than in the lights, where there was little or none, and thus what may be termed a "discriminating grain" would be produced by artificial means.

The result of trials with the above materials showed that a fairly good grain of this kind could be produced with fine glass-paper, but it was rather uneven and patchy. I next tried sifting granular powders—such as fine graining sand, emery powder, powdered glass and cuttle-fish bone (also previously treated with way)—on to the wet relief, and allowing them to dry. It was found that of these four substances the fine graining sand was the best, and gave a well-defined regular grain, deepest in the shadows, where the sand was drawn well into the thickest parts of the gelatine, as they contracted in drying, and progressively shallower as the gelatine became thinner in the lighter tints.

Further experiments have shown that, under certain circumstances, and with certain tissues, the action of the sand is to so thoroughly break up the gelatine relief that it appears quite like a chalk or stippled drawing in the lighter shades, as the plates exhibited will show. This action appears most strongly iu reliefs that have been treated with a solution of bichromate of potash after development—though with some tissues it appears almost as strong in reliefs that have either been dusted with sand immediately after development or after treatment with alum.

When the reliefs are dry the waxed sand can be removed without much difficulty, though it requires some care. It can sometimes be brushed off the reliefs dry, but it is better washed off under water. The sand is prepared by melting a small quantity of the waxy material into it over a gas or other stove, and when thoroughly mixed, it is removed from the stove, and well stirred till cold. The sand will then be found to retain all its granular properties, and be little altered in appearance. We have tried wax, paraffin, and stearine for coating the sand, and they appear to answer almost as equally well.

After the removal of the saud the reliefs are dried, and are then ready to be brushed with plumbago and electrotyped. There has scarcely yet been time to ascertain the full practical value of the method, or the best way of applying it, but as it seems promising, and is, so far as I know, the first instance of a "discriminating grain" being produced by purely artificial means, I have thought it might be of interest to the Society, and hope on some future occasion to be able to show some more perfect results.

I would take this opportunity of expressing my acknowledgments to Mr. Sawyer, and to his manager, Mr. Foxlee, for the kind and efficient aid I have received from them in working out the process, and also to Mr. Alfred Dawson, of the Typographic Etching Company, to whom I am indebted for many valuable hints and kindly assistance.

* Read before the Photographic Society of Great Britain.

ON THE DECOMPOSITION OF IRON CHLORIDE AND SOME OF THE ORGANIC FERRIC SALTS BY THE ACTION OF LIGHT.

BY DR. J. M. EDER.*

I HAVE myself endeavoured to ascertain the amount of photo-chemical decomposition which some of the salts of iron undergo in white daylight under, so far as possible, the same circumstances, in order to obtain a numerical value for the chemical energy of light in various cases. In these experiments solutions containing equivalent quantities of the different salts were exposed to the light, and the amounts of ferrous oxide, as well as of ferric oxide, were quantitatively determined by my silver nitrate method.† For checking the results, colorimetric tests were undertaken with potassic ferric cyanide; they completely confirmed those obtained by quantitative analysis, but, as they are less accurate than the latter, I do not place auy special reliance on them.

An aqueous solution of equal molecules of iron chloride and oxalic acid was most rapidly reduced; the solutions used were of such a degree of concentration as to contain 75 per cent. of iron. The solution of the other substances also were prepared in equivalent quantity. The unit=100 was taken to be the quantity of ferrous oxide, that is to

* Continued from page 556.
† Transactions of the Royal Academy of Science of Vienna, January No., 1880.

say of ferrous chloride, reduced from a mixture of ferric chloride and oxalic acid.

Degrees of photo-chemical decomposition of aqueous solution at 17° to 20° C. :—

Ferric-chloride + oxalic acid ...	... 100
Ferric oxalate	... 89
Ammonio-ferric oxalate ...	... 80
Potassic-ferric oxalate	... 78
Ferric tartrate	... 80
Ammonio-ferric tartrate... ...	... 80
Ammonio-ferric citrate	... 15
Ferric chloride + citric acid ...	... 19
Ferric chloride + tartaric acid	... 25

From these results we conclude that:—

(1). In general the ferric salts, in conjunction with oxalic acid or tartaric acid, are more readily reduced than with citric acid. This is clearly due to the fact that oxalic and tartaric acids can be oxidised with greater ease than citric acid.* The reduction of the ferric salt necessitates the oxidation of the organic acid.

(2.) Ferric oxalate is more readily decomposed by the luminous action than the alkaline double salts, and of the latter the potassic double salt undergoes the least amount of decomposition. It is curious that the greater or less stability of the salts under the action of light corresponds with this behaviour when the temperature is raised, for if only warmed in the dark, ferric oxalate is reduced, but not its double salts.

(3.) The chlorine is more readily separated from the ferric chloride under the agency of light in the presence of oxalic or citric acid, than the oxygen of the corresponding ferric oxy-salt. On the other hand, the contrary takes place in the presence of tartaric acid.

(4.) With reference to this last-mentioned point, it appears that the variable photo-chemical decomposition of the chloride and of the oxides has no relation to the affinity of chlorine or oxygen for iron, inasmuch as the readiness with which at one time the chlorine, and at another time the oxygen, is separated from the iron salt, depends on the nature of the organic substance which may happen to be present.

Now, if we examine closer the behaviour of iron chloride, of uranium chloride and nitrate, as well as of mercury chloride, when these salts are dissolved in water, and exposed to the action of light, we shall find that they are very slightly, if at all, reduced ; further, when we consider that the same substances, when in contact with oxalic, tartaric, and citric acids, sugar, cellulose, &c., are rapidly acted on by light, while these latter organic bodies are by themselves very slightly, or not at all, sensitive, we must come to the conclusion that:—

(5). A mixture of several non-sensitive substances may possess the property of great sensitiveness—without these necessarily forming a new compound—if only one of the constituents of one substance is able to enter into chemical combination with that of another. The examples above instanced seem to show that there is no close relation necessary between chlorine and one of the constituents of the organic bodies, although Dr. H. W. Vogel considers it to be the "chemical sensitiser" in silver compounds. The definition of sensitizer ought rather to be extended so as to include a whole list of substances, not only those which can combine with chlorine, or may be considered as sensitizers, but also those which can combine or enter into chemical relation with nascent chlorine as it separates under the action of light. Otherwise we are unable to explain the highly sensitizing action of the above-mentioned organic acids on iron and mercury chloride, uranium nitrate, &c., while under ordinary circumstances, and when used during the usual photo-chemical processes, they cannot in any appreciable degree enter into combination with chlorine, &c.

When a solution of ferric chloride and oxalic acid, as also one of mercuric chloride and oxalic acid, in an equivalent state of concentration, were exposed to the white light of day, and the quantity of mercurous chloride precipitated from the latter was determined by weighing, while the ferrous chloride of the former was determined by consecutively mixing it with mercurial chloride, solution of soda, and hydrchloric acid—this process has the effect of throwing down mercurous chloride, which can then be weighed—it was found that:—

(6.) In a mixture of ferric chloride and oxalic acid, a decidedly larger amount of equivalent ferrous chloride is found than in one of mercuric chloride and oxalic acid. The molecular decomposition under the agency of light, is greater in the case of ferric chloride + oxalic acid than in the case of mercuric chloride + oxalic acid, and also greater than in the case of mercuric chloride + ammonium oxalate. This behaviour is noteworthy, because chlorine combines more closely with iron than it does with mercury, and yet the former in the presence of organic substances is more readily decomposed by light than the latter. In this case the reducibility of the two compounds under the action of white light by no means corresponds with the greater or less affinity of their constituents.

In all these cases the power of absorption of the sensitive solutions on the different parts of the solar spectrum varies, and the photo-chemical reduction is in close relation with the absorption. It would seem, therefore, important to know what is the relative reduction of these salts in the different tones of the spectrum ; this is an investigation which I intend shortly to undertake.

In the table above given, the numbers express the relative degree of reduction of the salts of iron under luminous action ; they have their complete value when the solution contains from 1 to 5 per cent. of ferric chloride, or of the equivalent amount of the oxy-salts. When the degree of concentration is increased, the sensitiveness generally also increases, at the same time the differences in the quantities of ferrous oxalate precipitated decreases. For this reason paper soaked in one of the above-mentioned solutions behaves quite differently on exposure to light to the solution itself.

To determine the different degrees of sensitiveness under these circumstances, strips of paper are soaked in the respective solutions ; and after being dried were, several at a time, exposed under one of Vogel's paper photometers—an instrument admirably adapted for an experiment of this kind. They were then dipped in a solution of potassic ferric-cyanide, by which the "light-degree" was made visible by the blue colour. In this set of experiments also the mixture of ferric chloride and oxalic acid proved to be the most sensitive of all; next came the ferric oxalate, and then the ammonio and sodic ferric oxalates; potassic ferric oxalate was reduced least of all. The differences of sensitiveness between the different double salts were not so great as in the case of aqueous solutions ; the sodic and ammonic salts were almost equally sensitive. On this account I give the preference over the double salts of ferric oxalate to the sodic ferric oxalate for such photographic processes as cyanotype, chrysotype, &c., since it crystallizes well, is very sensitive, and readily dissolves in water.

Where practicable, it seems most advisable to employ a mixture of ferric chloride and oxalic acid, because it is the most sensitive. Ferric chloride, when mixed with tartaric or citric acid, and dried on paper, is less sensitive than when mixed with oxalic acid, but the difference is not nearly so great as in the case of solutions.

* A mixture of oxalic or of tartaric acid with potassic bichromate, decomposes and blackens rapidly in the cold, giving off carbonic acid. Citric acid, on the contrary, is only slowly attacked. Cailletet, *Journal de Pharmacie*, vol. xxxiii. p. 419 ; *Chemische Centrablatt*, 1879, p. 14.

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CONTENTS.

ADVANTAGES OF THE ALUM BATH.

A COMMUNICATION, recently made by Mr. Valentine Blanchard, with reference to the improvement of gelatine negatives by a prolonged immersion in a concentrated solution of alum, is of especial interest to photographers; for it appears to be a remedy for some of the most formidable difficulties to be encountered by those who are in the habit of working with gelatine emulsion processes.

Mr. Blanchard found that a negative which had been left by accident for some hours in the alum solution was clearer and less dense than before, while the film had become of a more horny character, thus pointing to alum as a remedy for discoloured films, over-density, and frilling. The action of alum on gelatine has long been known, and made extensive use of by manufacturers, many commercial gelatines being largely adulterated with it, in order to increase their toughness and consistency. It is this property of alum of rendering gelatine less soluble which renders it so efficient a remedy for frilling, an evil so well known to all, and so frequently the result of a prolonged immersion in liquids which, like ammonia, exert a slightly solvent action upon gelatine. Alum has long been advocated to counteract this so'vent action, and to increase the adhesion between the film and the glass. Besides increasing the toughness of the gelatine, it diminishes also its power of holding moisture; so that negatives dry much more readily after a prolonged immersion in alum, and are less susceptible to the influence of a damp atmosphere. When we consider the hygroscopic nature of gelatine, and the inconvenience of the length of time required to thoroughly dry a negative, this action of alum alone seems likely to prove of great advantage.

Again, it not unfrequently happens that, after a somewhat prolonged immersion in the alkaline pyrogallic developer, the film becomes quite discoloured, and of such a non-actinic colour as to interfere seriously with the printing properties of the negative. Even though the stain on the film may be almost invisible to the eye, it is doubtful whether such a developer ever leaves the shadows as transparent as they might be. Of the various remedies which have hitherto been proposed for this evil, all are open to very serious objections. Hydrochloric acid, used as a bleaching agent, even when very dilute, exerts such a solvent action upon gelatine that frilling is the almost inevitable result of its employment. Ammonium sulphocyanide is open to the same objection, while perchloride of iron acts powerfully as a solvent of metallic silver, and, therefore, rapidly diminishes the intensity of the negative.

Alum again comes to the front, in this case also, as a safe and certain means of improving discoloured negatives. If such a negative be immersed in alum, so that only one half is exposed to its influence for a few minutes prior to fixation, it will be seen, after fixing, that the immersed half is cleaner and brighter, and separated by a sharp line of demarcation, from the other half, which still retains its yellow colour. Pieces of paper, also, which have been stained by immersion in discoloured pyrogallic developer will be speedily bleached by alum, and, in this case, the action takes place even more quickly than with dilute hydrochloric acid, while perchloride of iron only makes the stain darker by a reduction of the iron salt in contact with it.

It seems probable that the action of alum upon gelatine films is due to its power of diminishing the hygroscopic capacity of gelatine, and, consequently, of extracting from it the water which it can no longer retain. That this action does take place has been already proved by the rapidity with which negatives dry after treatment with alum. The extraction of a large part of the developer still left in the film by this means may account for the increased brightness which it occasions. It may be added that, if the alum bath is not used until after fixing, the action does not so readily take place, apparently a much longer immersion being necessary to bring about the same result.

Lastly, Mr. Blanchard found that dense negatives are reduced by alum. If such be the case, alum must be capable of exerting a solvent action upon metallic silver. No doubt such an action would result if any perchloride of iron were present as an impurity, for it is well known that even dilute solutions of perchloride of iron act most readily upon metallic silver by converting it to chloride. Neither is the presence of iron salts at all improbable in alum. But, whether owing to the presence of impurities or not, we have found that, if a thin silver leaf be immersed in a concentrated solution of common alum for a long time, it does show evidence of a decrease in opacity, so that there would be nothing very improbable in the opinion that over-dense negatives are improved by prolonged action of alum.

The above remarks apply only to the alums proper, viz., the double sulphates of alumina, together with potash, soda, or ammonia. It must not be forgotten, however, that salts of very various, although of analogous, composition, are included under the class alum, in which other metals, such as chromium and iron, replace aluminium. Chrom-alum differs from common alum in its more vigorous action upon gelatine, and iron-alum would be quite unsafe to use, owing to the facility with which it attacks metallic silver. We have known of instances in which good negatives have been entirely lost by an unfortunate mistake in using iron-alum instead of common alum. Even in a few minutes the image will completely disappear under the action of iron-alum.

Seeing the advantages which result from the employment of such a cheap and easily-procured substance as alum, and the influence which it exerts upon the character both of the gelatine film and the metallic image, probably few photographers will hesitate to use it in all cases, for even should the negative prove all that could be desired without it, the keeping qualities and the drying properties of the gelatine will be greatly improved by it. If alum exert so much influence in eliminating from the film any traces of the developer, it can also be assumed as probable that it will likewise facilitate the removal of the last trace of the fixing solution. The difficulties of getting rid of hyposulphite from gelatine negatives are familiar to all, and many a good negative has been spoilt by the stains occasioned by an efflorescence of this salt, owing to imperfect washing. It is more than probable that a more general use of alum would materially lessen the chance of hyposulphite remaining in the film; in which case still another useful property must be added to the already enumerated virtues of the alum bath.

PURITY OF CHEMICALS.

As a rule, when photographic chemicals are obtained from reputable dealers, there is not much to complain of regarding their purity; yet sometimes it happens that photographic failures are met with which may be due to impurity, and the difficulty is to find out where they are in fault. Lately, when preparing gelatine and other emulsions in an experimental way, we have experienced some such failures.

In one gelatine emulsion we found that a distinct disintegration of the gelatine and frilling of the film took place after boiling, though the images developed on it were beautifully bright and free from the slightest trace of veil. Another emulsion gave a fogged image, which apparently nothing could remedy. In both these cases we were able to track down the cause of our failure, and since some of our readers may meet with like misfortunes, we give them the benefit of our experience. In the first case, we examined the nitrate of silver, and found on testing it that it was distinctly acid. It was not a recrystallized sample, but sold as ordinary commercial nitrate of silver. By applying further tests, we found, as might have been expected, that the free acid was nitric acid which had not been entirely eliminated when the first crystallization had taken place. We may here mention that the effects of acids in gelatine are somewhat anomalous. In very dilute solutions, when applied cold to solid gelatine, the first effect seems to be to render the gelatine insoluble, whilst heating a solution of gelatine with the same acid tends to cause a speedy disintegration of the substance. The cause of our first failure was now apparent, so we effected a cure in our next batch of emulsion by adding a few drops of a solution of carbonate of soda to the nitrate of silver solution, till a very slight precipitate remained. The emulsion made with this rectified silver behaved in its normal and proper fashion, the small trace of carbonate having no apparent effect on the emulsion.

The fog in our next emulsion was evidently not due to defective nitrate of silver, so we were forced to look to the other ingredient with which we formed the emulsion. This was bromide of potassium, and we found that it was slightly alkaline in reaction. It was a matter of some difficulty to decide in which way to treat this salt, since there was danger in mixing acid with it. We finally hit upon the following plan, which seems to answer perfectly. The solution of bromide of potassium we treated with dilute nitric acid till there was no alkaline reaction, and to such a point that litmus paper was slightly reddened. To the solution of nitrate of silver with which we were going to prepare our emulsion we added a trace of carbonate of soda, as in the first case, leaving a small precipitate, and this we added to the bulk of emulsion after the emulsification had taken place. By this means we had a perfectly neutral solution to boil, and hence no disintegration of the gelatine took place. We have also treated gelatine which had an alkaline reaction in a similar manner, with perfect success. Thus, after an emulsion was formed, a few drops of very dilute nitric acid were added to it. This rapidly neutralized all alkalinity, and the excess was taken up by the carbonate of silver, which, of course, we purposely added.

We have not the slightest doubt that many failures occur either through the acidity of the silver nitrate or alkalinity of the bromide or gelatine employed. An improvement may, perhaps, be made on the above method, but at any rate it has proved satisfactory in our hands. For our own part, we should say that where there is no great chemical knowledge, it is always safe to add five drops of a 1 per cent. solution of nitric acid in water to every 100 grains of bromide of potassium employed, and to add half a grain of carbonate of soda to every 100 grains of nitrate of silver used. The carbonate does no harm to the emulsion, and perfect neutrality is secured.

In fused nitrate of silver, and in recrystallised samples as well, there is often a trace of nitrite; where the bromide is in excess such is not hurtful, in fact, as has been pointed out, nitrate of potash, which would be formed by the double decomposition of the bromide of potassium and the nitrate of silver, is a sensitizer, and we may add, at all events, harmless. When ammonium bromide is used, alkalinity need not be feared, but rather acidity; hence in this case, too, the addition of a trace of carbonate of silver would not be objectionable.

Notes.

Last month there were but two photographs of Daguerre in the United Kingdom; to-day, there are many thousands. It is our good fortune to announce that they will constitute the frontispiece to the Year-Book of Photography for 1881.

Photographers will be glad to learn of the safe return of Mr. W. J. A. Grant from his fourth voyage to the Polar regions. Mr. Grant's arctic pictures, taken during former voyages, are well known at Pall Mall, and this time he brings back with him photographic sketches taken on board Mr. Leigh Smith's yatch *Eira*, which, as our readers may remember, paid a visit to Franz Josef land during the summer.

Mr. Grant says, "fortunately, my troubles were only those of an ordinary character, for my dark room was generally warm. We never had it colder than 10 or 11 degrees of frost, and our chief difficulties were caused by repeated mists, and the ordinary attendant troubles of working on board ship. The first two years I used the collodio-bromide and the wet process, while during 1879 and 1880 I employed only gelatine."

Arctic photography, through the medium of Lieut. Chermside, R.E., Mr. Mitchell, R.N., and particularly Mr. Grant, has been more instrumental in showing us the true character of the Polar regions than all the volumes that have ever been written on the subject. Instead of calling up false sentiments of romance, the photographs show us cold inhospitable shores, black seas, and storm-swept reaches, that bring home most vividly a sense of weird desolation and of ice-bound solitude.

Instantaneity in photographic processes has always been the goal of every pioneer in our art, and even the gelatine plates of to-day are considered capable of much improvement; nay, we have had promises on several sides of most extraordinarily rapid films being forthcoming. It is but another instance of history repeating itself, for in 1840 we find Daguerre writing to Mr. Hunt upon the subject of an improved process by means of which "it shall be possible to fix the images of objects in motion—such as public ceremonies, market-places covered with people, cattle, &c.—the effect being instantaneous." If Daguerre had had Mr. Mayland's sketches of the busy Thames, or Mr. Williams' animated pictures of Margate Sands, before him, he could not have written more enthusiastically.

The Dundee and East of Scotland Photographic Association contemplate holding a Photographic Exhibition in Dundee in 1881.

India-rubber articles, as everybody knows, are apt to become hard and brittle in time, and to lose their elasticity; but these qualities, according to Dr. Pol, may be restored by the very simple means of immersing them in a solution of ammonia. Two parts of water to one part of liquor ammonia is a convenient mixture, and immersion in this for a period of more or less than an hour is said to give back the rubber its original elasticity.

Why the stars twinkle, M. Montigny tells us, is because of the commotion in the air of the upper regions, or, when the phenomenon is especially remarkable, because bad weather is approaching. No doubt this change in the stars could be recorded photographically if need be, for the more a star twinkles the brighter it generally appears. Mr. Whipple must add yet another photographic recording instrument to those already in the Kew Observatory—a star camera to foretell good and bad weather.

The sea-serpent has again made its appearance, this time in *Nature*, which contains wood-cuts of the colossal animal. We may hope, therefore, at some future time, to have photographs of the mysterious being; it is upon the camera we shall have to rely to confirm or refute the mystery for ever.

Our readers will rejoice to hear that the Rumford medal of the Royal Society has been awarded to Dr. W. Huggins, F.R.S., for his researches in astronomy, and more especially for the interesting data resulting from his series of star photographs.

Mr. J. W. Swan exhibited his new electric lamp—a carbon thread aglow in a tiny glass globe—on Wednesday before the Telegraph Engineers, at the Institute, Great George Street. This is the first time the lamp has been seen in London.

The original Edison lamp, in which the light is also obtained by means of incandescent carbon in a vacuum, and of which the public has heard so much, is also to be seen in London just now, Colonel Stuart Wortley having secured it during his recent visit to America for the Patent Museum at South Kensington.

We are glad to find that "slow development" is still the order of the day with some of our careful landscape photographers, notwithstanding that rapid films and quick developers are everywhere available. Mr. Herbert Berkeley was good enough to show us the other day a fine series of Welsh pictures, whose development occupied, on an average, ten minutes. Mr. Berkeley employs pyrogallic development, and makes use of sulphite of soda as a restrainer.

Captain Abney's method of preparing a collodion emulsion sensitive to the "infra-red region of the spectrum," which we published last week, has been awaited with much anxiety by the scientific world, for the investigation of the spectrum by photographic means still occupies very much attention. With Captain Abney's new emulsion it would seem as easy, apparently, to photograph the invisible heat rays that come from a kettle of boiling water as the blinding beams of the sun.

Topics of the Day.

POSING THE MODEL.

BY LYDDELL SAWYER.

It is interesting to note how unalterably each photographic student, as he attains that proud moment of his life when he is first allowed to pose a sitter, determines to do something worthy of himself; to, in short, stamp originality on his work—and original, indeed, it invariably turns out to be, with little necessity to have it registered for preservation from piracy. The fault is that he has branched off into a bye-path of individuality at the beginning, instead of at the termination, of the common highway of photographic education. Hence he must retrace his steps. A primary point which he should bear in mind is that, independent of the due recognition of balance and unity in a portrait, there are particular positions suitable to different subjects,* and into which they should to an extent naturally fall without an undue amount of "packing." If a position is found not to "fit," it is invariably recommendable to change it at once, without a needless expenditure of time, otherwise it will only look pieced up when finished.

A good plan in some of these cases is for the photographer to take the place of the sitter, and, assuming the position vacated by the latter, to make the faults apparent by exaggerating them himself; then he may advantageously, as nearly as possible, show the pose he really desires to produce.

What photographer does not find himself occasionally fortunate in having a model who at once assumes gracefully the position indicated, and, while anxious to make alteration, trembles lest it be divested of its soul, yet that alteration made seems only to unfold further charms? These are the opportunities for firing off elaborate poses! Although even then it is as well to remember that simplicity is a principal charm in art, and that it is the grace delineated in the position, rather than the position itself, wherein exists the beauty.

Many photographers who do a large middle-class business, while their work is mechanically good, yet betray in it their ignorance of the rules of artistic form. Indeed, I have heard some of them openly avow that "that fiddling work is only for those fellows with little else to attend to." But this superficial reasoning is certainly entirely erroneous, for a knowledge of art must necessarily be as useful in producing quantities of negatives as it is when striving for quality alone; it gives the photographer decision. He no longer "halts 'tween two opinions;" he knows at once what he is aiming at, and that knowledge goes far towards the expeditious forwarding of his work.

* I use the terms "subject" and "model" indiscriminately, as I consider them both admissible in alluding to general photography, although they have a varied signification in individual pictures. A sitter having a representation of himself produced must certainly be the subject of the portrait, engrossing the principal attention of the photographer and idea of the picture, whereas, in the artistic sense, a painter's model is sometimes (like his brushes) only an auxiliary to the subject of a picture. In short, the subject is the idea of the picture, and the model may, or may not, be the subject, according to the desire of either the painter or the photographer.

I readily agree that an artist under the circumstances would not always succeed in producing exemplary work; the number of the customers, as well as ofttimes their class, probably renders that impossible; yet, if photographers studied more the requirements of pictorial composition, it would wonderfully reduce the number of incongruities which are so often at present the prominent features of a photograph.

When a great many sitters are to be dealt with it is well to adopt a "set" of accessories for the day—at least, as far as possible—otherwise the photographer expends most of that time on the arrangement of furniture, &c., which should be dedicated to the subject. This plan is carried out by many good photographers, and it is wonderfully practical; nor do I apprehend being considered inconsistent by advocating it, after treating on the individuality belonging to pose and model, since the latter is embodied rather in the sitter's self than in the accessories, and a chair alone is sufficient to produce innumerable positions. Indeed, the pose of the head alone is a host in itself, and it is the due attention to this which, in many cases, gives an inexplicable completeness to some portraits. The finest balance of lines in a picture may be easily destroyed by the wrong contour of the head, and its elevation or depression tends materially to change the entire expression of the features. Yet there is considerable variation in the position of the head natural to different sitters, and I would warn students of the danger they run, especially when long exposures are necessary, by pressing the head into a position in unity with the body, without first noting this particular; if it is neglected, invariably the sitter will return unconsciously to his or her most natural position during the exposure, and, of course, blur the features. On the other hand, if this seemingly trifle be strictly regarded, it is surprising how few failures will result from long exposures, because a subject who can remain steady for (say) twenty seconds, is generally able to remain free from motion with almost equal ease for at least three times that period—that is, as far as tremor alone is concerned.

There is room for the exercise of much discrimination in selecting the amount and size of the figure to be pourtrayed in photographs, as well as the position of it. No particular size should be adhered to, as is sometimes the case, merely because it is fashionable.

Busts filling a whole carte-de-visite should be approached with caution, and it should be also well ascertained that the lens to be used is qualified to bear the strain to which it is thus subjected.

Picturesque old men, or young persons with really good features, are the best subjects for large heads; middle-aged persons do not naturally like the prominence thereby given to their wrinkles and other indications of the approaching "sear and yellow leaf," and yet their removal by the retoucher, beyond what is exaggerated, is equally undesirable. Plain-looking sitters have obviously a kindred objection; and, moreover, there are generally redeeming graces in their figures which are lost in this sized photograph.

I think that sitters inclined to be stout are, of all others, most sensitive of their appearance, and subjected to the greatest disappointment on beholding their portraits. The most likely size to meet with approbation in their cases is between three-quarter and full-length, as thereby plenty of space is left about the body, and the absence of the feet or bottom of the dress also leaves a pleasing doubt as to how much taller the individual represented may really be. The arms should be judiciously disposed to conceal the actual outlines of the body to a great extent. The next size most likely to please is a small vignetted bust, with as little body shown as is compatible with the balancing of the head.

If I write more I fear I shall be disregarding our Editor's request for short practical articles, so I must conclude, feeling how inadequate is a brief paper, such as this, for treating on so exhaustive a subject as I am attempting.

With Mr. H. P. Robinson, I consider that students will derive great benefit by becoming acquainted with good painting and engravings of portraiture. These the student should note in every detail, and question closely why certain lines, accessories, and other auxiliaries hold their particular positions, endeavouring meanwhile to apply to them what knowledge he possesses of the rules of balance, unity, and sympathy.

I would, however, recommend the student to avoid photographs as studies—at least, unless they are the pet productions of our best men—for the reason that painters and sculptors must build up their productions from the foundation; in their works there is only visible what is conceived by them; hence even the smallest object receives their immediate supervision, and, if they are artists, it has a purpose with it; each point symbolizes some idea. But not so the photographer; his duty is to render artistic that principally which already has existence, and, though I doubt not but that this sometimes requires greater skill than the painter or sculptor is called upon to display, yet lack of time, or observation, or knowledge may—nay, does—frequently cause the photographer to overlook many faulty details which nevertheless come to light in the subsequent photographs, and render them far from desirable as examples of pictorial composition.

The "Topic" for next week will be, "On Intensifying Gelatine Plates with Silver," by Captain Abney, R.E., F.R.S.

ON THE APPLICATION OF PHOTOGRAPHY TO CHEMICAL RESEARCH.*

BY W. N. HARTLEY, F.R.S.E., ETC.,

Professor of Chemistry, Royal College of Science for Ireland, Dublin.

(2). *On the Photographic Transparency of Substances.*—It was found that colourless bodies which possess equal powers of transmitting the luminous rays vary greatly in permeability to the invisible rays. Thus, water is perfectly transparent, that is to say, thin layers transmit all rays, visible and invisible, from one end of the spectrum to the other. In speaking of thin layers I allude to thicknesses of three or four inches, or less, which are small in comparison with the considerable thickness of twenty feet, which is necessary to show the blue colour of water. Carbon di-sulphide, which is as transparent as water to the visible rays, cuts off the greater part of the visible spectrum. In comparing solid bodies such as quartz and Iceland spar it was found that these are quite transparent; so likewise is fluor-spar, while even thin glass used for covering microscopic objects, and thin films of mica, cut off the greater part of the ultra-violet spectrum.

Diactinic solids—that is to say, solids which are transparent to the chemical rays—preserve their diactinic power, both when liquefied and when converted into vapour. Colourless solids, which exert a considerable absorption upon the chemical rays, preserve their absorptive power with greater or less intensity, both in the liquid and the gaseous state.

Dr. Miller laid stress upon the care which it is necessary to bestow upon the preparation of compounds for examination as to their photographic transparency. Very slight traces of impurity were believed to be present in some of his most carefully-prepared specimens, which could not be detected by ordinary tests, but which were opaque to the chemically active rays. It was found, for instance, that filtering through very pure paper sensibly impaired the diactinic quality of a solution. It will be seen presently that we have since shown that photographic transparency is an exceedingly delicate test of the purity of organic compounds. An immense number of salts in solution of

* Continued from page 562.

various strengths were examined, besides a large number of organic bodies. The liquids were enclosed in glass cells with parallel sides of quartz, the plates of quartz being clamped on, but not attached by any cement, lest this substance might be dissolved to some extent, and impair the purity of the contained liquid. Other conclusions of great importance should not be overlooked, though they are only indirectly connected with the subject of photographic transparency. They are the following :—

The absorption of the invisible rays by reflection from polished surfaces.

A small polished plate of the substance under experiment—as, for instance, a plate of metal—was supported at an angle of 45° opposite to the vertical slit of the spectroscope, and the source of the rays was arranged so that they should be reflected in the direction of the axis of the collimator tube. An extraordinary result followed. "It was found that no judgment of the perfection of the reflecting power could be formed from the colour of the metal." For example, *gold* possesses the power of reflecting all the rays, even the most refrangible, very equally, though somewhat feebly. Next to gold ranks burnished *lead*; the spectrum from lead is, in parts, more intense than that from gold. No other metals approach these in reflective power as regards *length* of spectrum, but the reflections from *steel* and *tin* were more intense, but not so long.

These results of Dr. Miller tell us how useless it would be to try to obtain photographs of any length from plates of polished metal, ruled with fine lines, a method which surpasses all others for obtaining spectra of *coloured* rays. I have lately confirmed this by experiment, using a beautiful ruled mirror of speculum metal, on which were placed side by side more than 17,000 lines in the space of an inch, made by Mr. Rutherfurd, of New York. I have found it practically useless for photographic spectra, though, for observing the visible spectrum, it is unapproached by any instrument I have ever seen.

(3). *Photographic effects of the electric spectra of different metals taken in air.*

(*a*). *Pure Metals.*—Dr. Miller found that each metal has a distinctive spectrum, as is the case with the ordinarily visible rays, but the most highly characteristic portion of the spectrum is that lying beyond the range of ordinary vision; the spectrum of a metal is one of its distinctive properties, as much so as its tenacity, its ductility, specific gravity, or atomic weight. Metals of a similar chemical character exhibit certain similarities in their spectra. In short, a photographed spectrum is the portrait of a metal, and a family likeness exists between metals of the same family.

(*b*) *Spectra of Alloys.*—When equal weights of two metals are employed (tin and lead, for example, or cadmium and lead), a compound spectrum exhibiting lines belonging to both metals is the result; and it is not always the more volatile metal which predominates. Dr. Miller endeavoured to apply the spectroscope to the work of assaying gold and silver, and he was successful to a considerable extent in accomplishing this.

(4). *Photographic effects of electric spectra of different metals produced by transmitting the sparks through gases other than atmospheric air.*—Metallic electrodes were enclosed in a glass tube, one side of which was cut away and replaced by a slice of quartz, so that a stream of gas to be examined could be passed through the tube. Various gases it was known yielded different colours to the eye, but no judgment could be formed from this as to the nature of the photographic effect of the rays—that is to say, the kind of spectrum which the gas would furnish.

Gaseous elementary substances yield distinctive spectra, and compound gases yield the spectra of the elements they are composed of.

Professor Stokes made his observations with quartz apparatus, but, instead of registering the spectrum by means of photography, which he often thought of resorting to, he used a fluorescent screen, upon which he received the rays' and made a drawing of the position of the lines and bands observed, by means of a pricking instrument devised by him for the purpose. His researches extended to an observation of certain organic substances termed alkaloids, such as strychnine, and quinine and glucoside, and salicine and tannin. He found these substances to be extraordinarily wanting in transparency to the chemical rays, but when they were in solutions so weak as to admit of any rays passing, bands of opacity intervened between bands of transparency, these appearances being highly characteristic of the substances.

Notwithstanding that the photographs of spectra taken by the late Dr. Miller enabled him to draw certain just conclusions of great importance, they are by no means satisfactory representations of the metallic lines. I have been able to compare the original negatives with some of my own photographs taken with the same prism, and similar lenses, and it is easily seen that their want of clearness is caused by too wide a slit being used, and inaccuracy in focussing. Those photographs intended to show the absorption of rays by saline solutions and organic substances were useless in many cases.

In the year 1872, having determined to study the effect of organic substances on the ultra-violet rays, I reconstructed the apparatus of Dr. Miller, and spent much time in improving it, and ascertaining the best method of observing the obscure rays. The reason for choosing organic substances for a basis of investigation was the consideration that an immense variety of compounds similarly constituted are available, and all the physical properties of organic substances are dependent on their molecular constitution; that is to say, not only on the number and nature of the atoms they contain, but on the way the atoms are linked together. Thus all the hydro-carbons belonging to one class have certain properties in common; so it is with the alcohol, the organic acids, and likewise the alkaloids. Their characters are the same, but they differ in degree, according to well-known laws. Bringing to mind some familiar examples, the sweet taste of the sugars, the bitter of the alkaloids, the odour of essential oils, and the brilliant colour of many derivatives of aniline, all depend upon some peculiarity in molecular structure, possessed in common by the different members of each class.

Considering that the power of refracting light, or of watching a polarised ray, is dependent on molecular structure, it would be difficult to imagine that actinic absorption was not connected therewith. No encouragement, however, to pursue such a line of research was derived from a study of Dr. Miller's investigations, since he was unable to trace any special connection between the chemical complexity of a substance, and its diactinic power.

(*To be continued.*)

Correspondence.

EMULSION IMPROVED ON KEEPING.

Sir,—Allow me to corroborate Captain Abney's statement with regard to the increase of the sensitiveness of gelatine emulsion on keeping.

I have had some emulsion bottled for about three weeks, and the other day coated some plates, and compared them with those coated with the same emulsion immediately after it was washed. I found the sensitiveness had increased four or five times.

The plates at first were slow, about three times as quick as collodion—or, not to offend those who say that the figure represents the highest ratio which exists between the sensitiveness of collodion and of dry plates—about one-third as sensitive as those marked ten times as fast as wet, and sold commercially. I shall try whether an emulsion which is very sensitive at first increases in rapidity in a like degree.—I am, yours truly, W. K. Burton.

A NEW EMULSIFIER.

Dear Sir,—In your report of the Technical Meeting, when describing the perfected emulsifier, you omitted to mention Mr. T. B. Latchmore's name in conjunction with mine. The apparatus then exhibited was the joint device of Mr. Latchmore and myself.—Yours very truly,

Thomas B. Blow.

COLLODION *V.* GELATINE.

Sir,—In reference to "Transparent Highlight's," remarks published in your last issue on this subject and on my letter, I am very sorry to have "jarred his feelings with energy," not having meant to inflict pain on anyone. At the same time, I must think that he (unlike his plates) is rather too sensitive. My assertion was that in my practice gelatine dry plates were found to be certainly ten times quicker than wet ones. I have worked in my present studio about twelve years. The average exposure, in a good light, in summer—or, say, from May to September—would be twenty-five seconds, using the wet process. With the present dry plates, under similar conditions as to lens, lighting, and temperature, it would be about two seconds; for babies, and very nervous subjects, using a larger stop, and giving more light, about five seconds would be the least for a wet plate. For a dry one, half-a-second would amply suffice. These are not hap-hazard remarks made from a few isolated instances, but from continuous observations extending over a long time, and fortified by the concurrent experiences of my assistants.—I remain, yours truly,

A. P. Chambers.

PS.—I thoroughly agree with Mr. Burton as to the inaccuracy of the often repeated assertion "that gelatine dry-plates are more sensitive (relatively) to collodion in a dull light than in a strong one." It has always appeared to me untenable in theory, and unproved by practice.

TINTING ALBUMENIZED PAPER.

Dear Sir,—Noticing your article in last week's News on "A Method of Improving Prints," I would say that I have long adopted this plan of tinting the back, but to a somewhat different end, viz., for tinting the blank space round a vignette, as I find exposing the back of the print to light makes a deal of difference in tint on the front. In order to preserve the purity of the whites in the face, &c., I roughly cut a mask to the shape of the face and shoulders, and place it on the back when exposing to light. By this means a far more perfect tint can be obtained than by shading the image and tinting at the front.

I enclose duplicate prints as examples, and remain, yours truly,

E. A. Maxwell.

Proceedings of Societies.

Bolton Photographic Society.

The annual meeting was held on the 11th November, Mr. Thos. Parkinson in the chair. The ordinary formal business having been transacted, Mr. A. Brockbank was elected a member of the Society. Mr. Harwood and Mr. Rideout were appointed to scrutinise and cast up the voting papers, the following being the result:—

President—Jno. Hick, Esq.

Vice-Presidents—Thos. Parkinson and Robt. Harwood.

Secretary—Chas. H. Dalton.

Treasurer—W. Banks.

Council—Messrs. Hick, Dalton, Harwood, Parkinson, Galloway, Banks, Tonge, Knowles, Haslam, and Heaton.

The report of the year's proceedings was then read by the Secretary, of which the following are extracts:—

"Mr. President and Gentlemen,—We meet to-night to celebrate the birthday of the Bolton Photographic Society, the first constitutional meeting being held in this room on the 6th of November, 1879. The preliminary meetings necessary for its formation were held at the West Ward Reform Club, in Duke Street, in the September and October of that year.

"The temporary Council, consisted of Mr. Parkinson, president; Mr. John H. Galloway, secretary; Mr. Banks, treasurer; and Messrs. Shipperbottom, Rideout, Wigglesworth, Long, Dalton, and Grundy.

"In the January of 1880 the Society was fairly launched on its career under the presidency of John Hick, Esq., and a council of nine gentlemen.

"Whether the present Council has been enabled to carry out that project to your satisfaction, you must, of course, form your own opinions; but I may say under the experimental state the Society has been in during the last twelve months—quite a young beginner, as it were—it has been a very difficult task to beat up anything like a presentable amount of interesting or debateable matter for the monthly meetings. I trust, however, that the gentlemen who have the fortune to be elected to the onerous burden of guiding the Bolton Photographic Society during the coming year may find a little more energy in its members, and that they will have grown out of the habit of apparently blushing at their own remarks. They are now no longer a hobbledehoy, but a full grown Society, and, as such, should have a sufficient pride of self to look after their own interests and information, telling us boldly what they know, putting it in as recitable a form as possible, and letting us have the benefit of their experiments and experiences at the earliest opportunity. They will find that confidence begets confidence, and very soon we may possibly have around us a host of gentlemen volunteering papers for the meetings.

"Returning to the birth of our Society, the names of the gentlemen who were present at its formation not having been recorded, I am unable to lay before you their numerical strength; however, I find twenty-four members paid the first subscription in January, 1880.

"Up to the present month, nine have been elected, and one has resigned, leaving a total of thirty-two members.

"A necessary reform is the summer programme; instead of the place of last year's excursions, alternate Saturdays, it would be preferable to choose three or four picturesque localities, within easy distance, for a half day's visit, fix the dates, and abide by them.

"Two very necessary alterations were accomplished last meeting, viz., the election of two vice-presidents in future, and the fixing of November for the annual meeting.

"I would also suggest that the Society hold a soiree or annual gathering (say about February next) modelled upon that of the Teachers' Association. The year's works could be exhibited, with various new instruments, cameras, &c. Some gentleman of note might give a lecture on photography, and a lantern exhibition, with the development of a plate shown on the screen. These, with other interesting matters that would arise, could be interspersed with music for those who preferred lighter enjoyments (supper of course, being thrown in). On the whole, I think it would be a great success."

Mr. Haslam moved, and Mr. Jukes seconded, a vote of thanks to the Council for their services during the past year, and congratulated them on the Society's success so far, trusting it would go on increasing during the coming season.

Mr. Catlow moved a vote of thanks to the officers, which was seconded by Mr. Hampson, and responded to by Mr. Parkinson.

The meeting was then brought to a close.

Talk in the Studio.

South London Photographic Society.—The annual meeting of this Society will take place on Thursday, December 3rd, at 8 p.m., in the rooms of the Society of Arts, Adelphi. The officers for the ensuing year will be elected, and Mr. W. Cobb will read a paper on "Ballooning from a Photographic Point of View."

The Place of Photographs.—When we look around and see the endless inventions for reproduction, and the time-saving appliances for art, we wonder that art has not been assisted by them. And wonder we may, when we contemplate such marvellous inventions as photography. Photography fills a place that nothing else could fill, and is, in its position, a blessing to mankind. Socially, photography holds a place of honour. Artistically, and owing principally to its improper application, it has helped to vulgarize most things good and noble. A photograph can always interest, but can never charm; it is for ever cut off

from art, even as great art will remain untouched by mechanical aids. I rejoice in every new inventiou or discovery, but deplore the manner in which many are applied. What is the cause of the presence, and apparent success, of all the photographs of bad pictures, of all the hideous advertisements, and of all the vile selections of subject—all productions of the highest possibilities of the reproducing art, visible down to our very match-boxes? It is the race for wealth! We are creatures who prey upon each other, and we think the shortest road to wealth is to pander to the lowest tastes of man. Never were there such prizes to be won as in this age—prizes for virtue—prizes for goodly work. Men are fools to waste their energies upon the depraved tastes of a few. Men sin when they say the common man, the hodman, cares for nothing but his hod, his pipe, and his gin. The common man has common sense, and common sense stands side by side with justice.—Mr. H. HERKOMER, A.R.A, at Leicester.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. PIPER AND CARTER, "*Photographic News*" *Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. PIPER AND CARTER, *and crossed* "*Union Bank, Photographic News Account.*"

ALICE BURVILLE.—Iron will not rust in contact with dry air or dry oxygen. Rusting is, in the main, due to moisture, oxygen, and carbonic acid. A solution of caustic potash absorbs carbonic acid, and neutralises any action which tho oxygen of the water might be disposed to set up. Mr. Spiller, whose namo is so well known in photography, suggested the employment of caustic potash in boilers more than twenty years ago to prevent incrustation and rust, and his suggestion was adopted in noarly all the arsenals and dockyards of tho Kingdom.

ISAAC DANDO AND SONS.—1. It is a subject we can hardly express an opinion upon, for several reasons; write to Mawson and Swan, and Luxograph Company. 2. See our "At Home" at the Maison Lejeune, in NEWS of June 4.

H. HARDING WARNER.—We shall have much pleasure in inspecting it.

QUERIST.—You will find either dilute nitric acid or a solution of caustic potash will remove the greasy character of the plates. The surface must be washed in running water afterwards, and then there is no fear of injuring tho bath.

O. A. M.—1-2. You could not use the powder process unless you had extraordinary means of illumination at your disposal: certainly the magnesium light would not do; the exposure would be far too long. 3. No other but that you mention, and this is only available under special circumstances. 4. Good River paper is often employed; a slight coating of shellac would at once prevent absorption.

F. J. MITCHELL.—See our "At Home" this week.

REMBRANDT.—We regret we cannot inform you, but wo do not think they possessed any great advantages.

W. H. P.—The great thing, as you know, is to get a thick film with opacity, so that there may be plenty of vigour and density, even if the plate is not backed. It is in the anxiety to get these qualities that the former employs so much material; but if you can get a thick film of gelatine upon your plate, less might well be employed with quite as good a result.

MISFORTUNE.—It is very difficult to give you a definite answer, as the fault may lie in the bath, collodion, or developer. If you have a second bath, try collodion and developer in conjunction with it, and in this wise you will be able to localise the fault. We rather suspect your bath is to blame. Try a preliminary coating of albumen to your plates, and develop one without taking it out of the dark room, to see if you get a clear and satisfactory film.

D. S. I.—The print you send is not very well blended into the margin, but if this were done, the effect, we think, would be both happy and attractive.

GERMANICUS.—1. Wo cannot givo an opinion one way or another, as it would be something of a warranty; you are quite right in your surmise. 2. Mr. Swan will probably say something about it in tho YEAR-BOOK, but you must not expect it in the market for somo time. 3. It should be kept corked down; a little more or less does not matter much.

E. HYDE.—Wo will ask him.

SOUTH DEVON.—It is usually sold uncoloured, the price, we believe, being a guinea. The size of print is 20 by 15 inches.

J. B.—We are very pleased to possess your charming pictures. Thank you very much for them.

LENS.—A ten by eight portrait lens will answer your purpose.

J. T.—We have made enquiries, and find the work you refer to is out of print.

K. S. O.—Received. Thank you.

IRON.—Yes; tho ordinary wet process, with iron development.

To secure insertion, Advertisements must be forwarded at once.

The Photographic News, December 3, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

COLLODION *versus* GELATINE—PHOTOGRAPHY IN NATURAL COLOURS—NEW RESEARCHES OF DR. EDER.

Collodion versus Gelatine.—The question opened by us as to the relative sensitiveness of wet collodion and gelatine dry plates, has been taken up by many, and we see that we do not stand alone in our opinion. We will here shortly describe our experiments, so that the reader may understand how we arrived at our opinions. One of Dallmeyer's stereoscopic cameras, with two lenses absolutely equal in respect to light, was directed at a sitter in black clothes, while a wet collodion plate, and the gelatine dry plate to be tested, were put side by side in a slide arranged for this purpose. The light was so regulated that artistic pictures were produced. The wet plates required twenty-four seconds to give fully exposed negatives with the necessary details in the shadows; while the gelatine plates were exposed for different lengths of time, with the result that from two to eight seconds were necessary to obtain a picture as well exposed as that produced by a wet plate in twenty-four seconds, thus proving that under these conditions the gelatine plates were about three times as sensitive as the wet plates. We confess that in bright weather, if the whole atelier is open, the circumstances are more favourable for the gelatine plates as regards sensitiveness. In the above experiments, more than half the atelier was completely veiled with curtains, this being necessary to obtain an artistic picture. According to Dr. Vogel, another circumstance influences the sensitiveness, and that is the colour of the light. The wet plates are most sensitive for the indigo rays of the spectrum, the gelatine plates more so for the less refrangible *blue* rays. Now the quantity of blue and indigo rays in daylight is variable, and therefore, if it contains more of the blue rays and less of the indigo, the gelatine dry plate will be more sensitive in comparison with a wet plate than in the contrary case.

Photography in Natural Colours.—Some years ago, the news of the invention of photography in natural colours was first published in the newspapers. The fact is, however, that various investigators occupy themselves now, as before, with this problem, and pictures, said to be in natural colours, have been published by Albert, in Munich. Albert uses the process of Ducos du Hauron. He takes three negatives of the same object with plates made sensitive for different colours. Dr. Vogel's researches show that it is possible to sensitize bromide of silver for the red rays by mixing it with any dye which absorbs red rays; in the same way it can be sensitized for yellow and green rays by the use of suitable dyes. If a picture is taken with a plate which is sensitive for all colours except red, a negative is obtained which, printed off in red, gives the red tints of the original. In like manner, a plate sensitive for all colours except blue would give a printing plate for the blue tints, and a plate sensitive for all colours except yellow, a printing plate for the yellow tints. The three prints combined should give one in its natural colours. At first sight it seems absurd to speak of a plate sensitive for all colours except blue, for even the bromide of silver mixed with dyes preserves its sensitiveness for blue. Ducos du Hauron must, on this account, shut out the blue rays in the cases in which the blue light has no action; that can be done by means of orange-coloured glass, which is put before the lens. The choice of the proper printing colour gives more difficulties. It is easy to say that the colour is red, but the question is, which—crimson, alizarin, or Vandyke red? There is also the question as to how clear or how dark the red must be printed? Of course, all this depends on the pleasure of the printer, and, therefore, it is not really photography in natural colours. We have seen a collection of 1,000 such pictures from Albert's atelier in Munich. These were so different, that it was possible to divide them into seven different groups. In many of the pictures (which were landscapes) blue predominated, in others red, and in others yellow, and many had a brownish colour—in short, they were clearly not the natural colour. We will not, however, criticise too closely the merits of Albert's method. He has, in fact, by a combination of Ducos' method with lichtdruck, been the first to make the former process capable of being practically used—even though results are not perfection. Allgeyer, the editor of a new book on lichtdruck, and manager for several years in Albert's printing establishment, says, in his book:—"Granted that the right kind of print is produced with all three negatives, then the fixing of the three pigments to be used opens a wide field for investigation. But even if all these factors are securely established, the changeableness of the surface for printing, which is dependent on the nature of the lichtdruck process, will always remain an intrinsic hindrance to the production of a picture agreeing well with the original, in a process in which the least change of any of the shades of colour is so very apparent. The production of a really good copy by the lichtdruck process in *one* colour being difficult, it must be much more difficult with three printing plates in three colours." The proper time of exposure of the original negative must also be brought into consideration. We have no means of hitting the latter absolutely accurately. It is only seen on the finished print, *e.g.*, whether the negative for blue was exposed long enough. Finally, there is a drawback in the method of colour-printing. Chromo-lithographers are by no means satisfied with three or four lithographic plates to produce all shades of colour. They often take ten or twelve stones for quite simple pictures; they do not print the colours immediately in full strength, but print one faint tint over another—alternate thick and thin colours—and give the whole a final coating, for harmony. Sometimes as many as twenty or thirty lithographic stones are used for a picture, and in the renowned establishment of Prang, in Boston, occasionally forty printing plates are used for one picture. Only by this means, delicate harmony of shades and soft transitions are possible, and this can never be attained by using three printing plates, according to Albert's method. Such a method can only give crude, inartistic results.

New Researches of Dr. Eder.—Dr. Eder, the unwearying and ingenious investigator in photo-chemistry, seems determined to examine all branches of this subject. We are indebted to him for much work on the chemistry of chromates, and equally important work on gun-cotton, and the principles of photography with gelatine plates; now a no less interesting work on the photo-chemistry of iron salts, published in these columns, has emanated from his pen. The chemical composition of the salts in question, and the exhaustive study of their photo-chemical properties, are equally to be admired. Compared with this rapid progress in photo-chemistry, it seems as if photographic optics and physics were somewhat neglected now-a-days. With regard to the photo-chemistry of iron salts, the investigation of Dr. Eder, proving that the compound most sensitive to light is a mixture of ferric-chloride and oxalic acid, is interesting. After that comes ferric oxalate in sensitiveness, and then ammonium ferric oxalate. Ferric tartrate is somewhat similar, but Eder has proved that ferric citrate has only a slight sensitiveness to light (ammonium ferric citrate is only about one-sixth as sensitive as ferric oxalate). These results are only shown well in solutions. If the salts are contained in paper, the differences in sensitiveness, according to Dr. Eder, are not so great. However, the mixture of ferric chloride and oxalic acid is the most sensitive in this case also. As is known, Herschel was the first who prepared pictures with iron salts, as the cyanotype, the chrysotype, &c. These methods of his were at first ignored. Cyanotype is now again brought into favour. Engineers and designers use it for the

reproduction of their drawings; they mix solutions of red prussiate of potash and ammonium ferric oxalate, dip a sheet of paper into the mixture, dry it, and then expose it to the light under the drawings. Protoxide of iron is formed by the chemical action of light on the ferric salt, which forms Turnbull's blue with the red prussiate of potash. It must be mentioned, however, that red prussiate of potash alone is decomposed in presence of light. If paper is impregnated with a concentrated solution of red prussiate of potash, and then dried, it gives a pale blue picture when exposed under a negative. Yellow prussiate of potash is also sensitive to light, as Schönbein was the first to point out.

At Home.

BRIGHTON IN THE SEASON.

The tide of the Brighton season is supposed to reach high-water-mark at the Polo Ball, which was held last week at the Pavilion; and it is certain that the town could not be more full of life and gaiety than was the case a few days ago. Brighton quickly looks gay if you only give it a chance. No sooner does the wind and rain cease, than, with the first glimpse of sunshine, Brighton dries up her tears, regains her bright smile, and looks as if bad weather never troubled her. The shining white houses bordering the King's Road and the beach—the broad green esplanade, the pleasant red-brick pavement—the spacious roads and the level parades with their neat iron rails and trim terraces—the bright shops—the fast-rolling chariots and animated riders—the gay toilets—let there be but an hour's moderate weather, and all these are seen to advantage. Brighton is fickle, but for that reason she is the more seductive. The "soft" paving, as our friends the Dutch style their favourite red-brick pavement, dries within ten minutes of a storm, and the magnificent pier is so cunningly sheltered with plate-glass, that you may sit comfortably listening to the strains of the town band, though it blows half-a-gale.

It is true that even in the sunshine it is none too warm. The rays strike down in a very slanting fashion, and, early in the afternoon, the red orb sinks into a bank of cloud, which has all the solidity of a far-off land out at sea; a chill arises, that speedily sends home most of the fair company who crowd the King's Road in firs and tippets, velvets and sealskins, to assemble around ruddy fires and five o'clock tea. There is little twilight, and darkness falls while the clouds are still aglow to seaward.

The short days of the Brighton season not only cut short the entertainment of visitors, but, unfortunately, prevent our friends the photographers from benefitting very much by the busy time. Brighton photographers are, indeed, rather hardly used on this account. All the grand people come down to visit them just when the precious daylight begins to fail; but, for all that, it must not be supposed that Brighton photographers are idle. On the contrary, to judge by the number of thriving businesses both, of a high and middle-class, they flourish exceedingly well. Mr. Mayall's studio in the King's Road—a classic name among photographers—is a centre of attraction with visitors, for the handsome gallery contains many portraits which are now historical. There are fine pictures of Lord Palmerston, Earl Russell, the Prince Consort, Daguerre, Wheatstone, Sir D. Brewster, Sir J. Herschel, &c., &c. Mr. Mayall's studio is, indeed, in such a flourishing condition that, as soon as the Brighton season ends, he purposes opening an establishment in New Bond Street, and so follow his patrons to London.

In the King's Road, also, we find a fine studio of Messrs. Lock and Whitfield, who exhibit exceedingly good work, that reminds one a good deal of fine miniature paintings, so delicate and soft is the portraiture. A lady in a clear white costume and white parasol among the examples, was a delightful study, full of artistic quality and rare finish. Next door is the studio of Hennah and Kent hardly less attractive, whose speciality seems to be the mounting of photographs under glass slabs, whereby, as we know, the appearance of a good picture is often further enhanced. Messrs. Hennah and Kent also show some charming coloured work, which likewise proves a source of much attraction. Bertin's studio also faces the sea; here the work exhibited has that brilliant appearance which we usually connect with the French and Viennese school of photography, Bertin displaying a large collection of promenade or panel portraits in his show case. Lombardi and Co. have a studio in the King's Road, and a second one in West Street, a firm, as everybody knows, capable of turning out excellent work. The studio of Monsieur Boucher, close to Brill's Baths, is another well-known landmark of Brighton, and, just now, it is peculiarly attractive by reason of a series of cabinet portraits of Madame Nilsson which are exhibited. This series of pictures reflect much credit on the Boucher establishment, representing, as they do, quiet, artistic work that cannot be too highly praised.

Near the Old Steine is Mr. Donovan's studio, one recently-established, but already possessed of considerable reputation. Mr. Donovan seems particularly happy in his children's portraits, which denote rare taste and skill, and a relief and modelling, unfortunately, too seldom seen in every-day portraiture. The establishment of Messrs. W. and A. H. Fry is also a popular one, the work of Messrs. Fry being of a first-class order, giving its producers title to take high rank in the photographic profession. The cabinet portraits of this firm especially are distinguished by a considerable degree of artistic effect. The name of Mr. E. Fox, in Market Street, is so well known in connection with the "Brighton Cats," that no words are necessary on our part to introduce him. Besides the whimsicalities he is so clever at producing, Mr. Fox is a very capable landscape photographer, as many examples of his work here testify. Another studio of note is that of Mr. Hall, in West Street; but besides these we have mentioned, Brighton has many other studios where good work is done.

All photographers are interested in the question of artificial lighting, but none more so, as we have shown, than those at Brighton. Mr. Mayall has decided on emulating the Court photographer at St. Petersburg, where, by the way, they are worse off even "in the season" than the Brighton photographers. In St. Petersburg, in the winter time, there is not more than a couple of hours of photographic weather very frequently in the day, and the consequence is portraitists do not participate much in the welcome harvest that a crowded season brings. No doubt Mr. Warnerke, who has been sojourning in the Russian capital for some months, showing the way to make gelatine plates, will be able to assist his brethren out of their difficulty to some extent; but in the meantime Levitsky, who enjoys the highest reputation in the profession in the city on the Neva, has taken care to have a system of electric illumination fitted throughout his studio. Every apartment is thus turned into an atelier, and, in dull weather or fine, morning or night, photographs are taken without difficulty in the Levitsky studio. As many sitters can be accommodated as there are assistants. The electric light is lit up in one room or the other as occasion requires, and portraits are taken.

Mr. Mayall is making arrangements to light his new studio in Bond Street in the same manner, and, if it is successful, will illuminate that in Brighton after the same fashion. But we hope that in a little while it will not be the few, but the many, who will be able to adopt the electric light in their studios. Now Mr. Swan has taken London by storm with his new lamp—we are proud to have been the first to announce the wonder some time ago—photographers may well hope for electric illumination, and they may rest assured, too, that anything Mr. Swan can do to render his simple invention applicable to the studio

will be done. Again and again has Mr. Swan put forward his hand to give us a helping hand, and he is not the man to forget his old friends in the hour of his triumph. To Mr. Swan photographers—and especially those situated like our good friends in Brighton—must look for a proper solution of the problem of artificial lighting; and from what that gentleman told his audience last week at the Institute of Civil Engineers, we shall not be kept long waiting. It was due, in a measure, to Mr. Swan's active co-operation that Mr. Laws, of Newcastle, was able to perfect his simple and ingenious method of artificial illumination by means of gas, and we may well hope that his new electric lamp —a simple carbon thread heated to a glow by electricity passing through it, the carbon the while being confined in a high vacuum to prevent its combustion or decomposition—will confer the same vast benefit on the photographer, as it bids fair to do upon the community at large.

The "At Home" for next week will be, "The Platinotype Company at Bromley Road, Lee."

ON THE APPLICATION OF PHOTOGRAPHY TO CHEMICAL RESEARCH.*

BY W. N. HARTLEY, F.R.S.E., ETC.,

Professor of Chemistry, Royal College of Science for Ireland, Dublin.

I shall now briefly state the subjects investigated by Prof. Huntington and myself, and afterwards a summary of the results obtained.

1. *On metallic spectra and the best means of observing absorption spectra.*
2. *On the action of alcohols, organic acids, and ethereal salts on the ultra-violet rays.*
3. *On the absorption spectra of benzene derivatives.*
4. *An examination of essential oils.*

1. *On Metallic Spectra.*—M. Soret invented a spectroscope constructed with lenses, and a prism of quartz, and an eye-piece of very ingenious construction, with which he was able to see the ultra-violet rays. He repeated these observations of Dr. Miller, and confirmed his statements with regard to the absorption caused by various substances. In these experiments it was found that a metal which would give as nearly as possible a continuous spectrum would be an advantage in the work, but that the lines of cadmium were well adapted to serve as accurately known fixed points in the spectrum to be referred to. We had carefully investigated certain spectra, such as those afforded by electrodes of magnesium, cadmium, indium, zinc, tin, bismuth, antimony, lead, mercury, silver, gold, copper, platinum, aluminum, iron, and nickel. For general purposes the spectrum of nickel containing a trace of copper is the best, as it gives a very long and nearly continuous spectrum. For purposes of gaining accurate adjustment in the parts of the instrument, and for careful focussing, electrodes of cadmium gave the best results, as the lines are very brightly seen on a fluorescent screen, and are easily impressed on a photographic plate.

The method of Stokes was found convenient for the preliminary examination of substances, focussing, &c.; instead, however, of using the fluorescent screen which he employed it was found moreadvantageous to steep a piece of white paper in a solutionof œsculine, or to use a thick piece of uranium glass.

The transparency of different kinds of very fine optical glass made by Feil proved this substance to be useless for the construction of any part of the apparatus through which the rays had to pass.

The same character must be given to Canada balsam, even when in such thin layers as lie between the surfaces of two lenses cemented together.

Fluor spar and Iceland spar were as diactinic as quartz. A layer of water three inches thick did not intercept the rays. Very pure alcohol was very transparent, though not perfectly so.

2. *On the action of alcohols, organic acids, and ethereal salts on the ultra-violet rays.*—A large number of organic substances can be conveniently classed into series of homologous bodies. The first member of a series is the simplest in structure, but all the others are built on the same plan, their differences being gradational and of a very simple character. Each member differs from the preceding one by containing an atom of carbon and two atoms of hydrogen more in its composition, that is to say, twelve parts by weight of carbon, and two parts by weight of hydrogen. Thus, taking a series of hydro-carbons called paraffins, several members of which are contained in crude petroleum, equal volumes of the several substances *in a state of vapour* will contain—

	Composition in parts by weight.	Atomic proportion.	Symbolic expression.
1*st Member*	Carbon 12 ...	C=1 atom	
	Hydrogen 4 ...	H=4 atoms	CH_4
			Difference CH_2
2*nd Member*	Carbon 24 ...	C=2 atoms	
	Hydrogen 6 ...	H=6 atoms	C_2H_6
			Difference CH
3*rd Member*	Carbon 36 ...	C=3 atoms	
	Hydrogen 8 ...	H=8 atoms	C_3H_8

and so on.

A formula which is typical of the whole series is expressed thus: $C_n H_{2n}+2$, where n stands for any whole number.

Calculating the precise formula for the tenth member of the series by substituting the member ten for n, we arrive at $C_{10}H_{22}$.

Certain compounds, termed alcohols, are known which differ from the paraffins by an action of hydrogen being replaced by an atom of hydrogen linked to another atom of hydrogen, such a group of atoms being called hydroxyl. The first member is methylic alcohol, the second is ethylic alcohol, the ordinary spirit of wine of commerce.

Name of alcohol.	Comp sition in parts by weight.		Atomic proportion.		Symbolic expression.
Methylic	Carbon 12	...	C= 1	...	$CH_3{\cdot}OH$
	Hydrogen 4	...	H= 4	...	
	Oxygen 16	...	O= 1	...	
					Difference CH_2
Ethylic	Carbon 24	...	C= 2	...	
	Hydrogen 6	...	H= 6	...	$C_2H_5{\cdot}OH$
	Oxygen 16	...	O=16	...	
					Difference CH_2
	Carbon 36	...	C= 3	...	
Propylic	Hydrogen 3	...	H= 8	...	
	Oxygen 16	...	O=16		
					$C_3H_9{\cdot}OH$

It will be seen above that the atomic proportions or relative weights of the atoms as stated above are—Carbon =12; hydrogen =1; oxygen =16, or an atom of carbon weighs twelves times, and an atom of oxygen sixteen times, as much as an atom of hydrogen.

One of the first branches of inquiring into the action of organic substances on the ultra-violet rays was intended to show whether each additional proportion of carbon and hydrogen in a homologous series influenced the transparency of the substances. It is evident that to make the experiments satisfactory, either equal volumes of vapour must be examined, or, knowing how much vapour a certain weight of substance would yield, to take weighed quantities of the substances proportional to equal volumes of vapour.

This latter plan was adopted.

The result of the inquiry proved that for each increased proportion of carbon and hydrogen there was a definite shortening of the spectrum, also that the eighth member of the alcohol series cut off neary all of the invisible rays of the spectrum. The same effect was produced by the corresponding difference in a homologous series of acids. Now, it is a well-known fact that the greater the proportion

* Continued from page 574.

of carbon in substances belonging to a homologous series, the higher is the boiling point of the substance; from which it follows that the absorption of the chemical rays by individual members of such series increases with the temperature at which substances boil.

A large number of experiments were made with bodies of a more complex structure, which led to the conclusion that minute traces of impurities quite incapable of detection by any other means, cause an extraordinary influence on the absorption of the chemical rays.

Certain experiments on alcohol and acids illustrated this exceedingly well.

Professor Miller found that methyl alcohol, the first member of the alcohol series, and therefore the simplest in structure, was less transparent by far than ethyl alcohol. Having Dr. Miller's specimen at my disposal, it was examined, and this observation was confirmed. This methylic alcohol was prepared with great care from methylic oxalate, by distilling with potash. This process gives the purest product known. Some of the alcohol was prepared from oil of winter-green, by distilling with potash, and it gave a much larger spectrum. A large quantity, about two pounds weight of the purest oxalate of methyl, was then distilled with potash, all care being exercised to get a perfectly pure product. This yielded an alcohol which transmitted almost perfectly the entire photographic spectrum, and was, indeed, the most perfectly transparent liquid, except water, that had been examined. All doubt as to the influence of minute traces of impurity was thus clearly set at rest.

(To be continued.)

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."

No. 12.—Photographing under Difficulties.

I now reach forth my hand, and lift the last of my first batch of negatives: there are four strapped together with an elastic band: instinctively I know what they are. I drop them on my knee and gaze dreamily on the scene before me; it chimes well with the scenes and season where and when I made these negatives. Spring, with its cheering buds, has followed the last winter's snow; the hot summer with its fruits has slipped away, the sere and yellow leaf has once more overtaken us. It is a sad thought—soon shall we have bare boughs and bleak winds. The fall of the leaf! It may mean nothing to the rich, but to the struggling poor it means everything—it means want—it means hunger and cold, and, perhaps, a still greater misery—the hospital!

These negatives were taken in the heart of the Fens in Lincolnshire. I had seen the seeds sown on the flat and fertile fields where, fifty years before, the foot of man had never trod; when the miles and miles of rich arable land had been a stagnant, treacherous swamp. I had listened to the tales of the good country people, as they told how he had bought his thousand acres for a mere song, how cleverly he had drained it, and how he now drove in his carriage, and was a J. P., to boot. I had seen the yellow fields waving in the evening breeze; I had marked the brown faces of the sturdy reapers, and thought that, at every swoop of the scythe, I saw want cut down, and in every sheaf they bound, I fancied they fettered down another human misery. I had marked the loads of dead leaves as they whirled along the dusty roads, and at last I had nothing to look upon but bare fields, bare boughs, and nothing to rejoice in but raw rheumatic winds.

The scenery in Lincolnshire is not very picturesque. You can stand on a stile and let the eye take a circle of forty miles in diameter, and see nothing except a few solitary wind-mills and the scranny trees that, as a rule, surround the homesteads. Had it not been for Jack Rattle, the sub-editor of a London paper, that lodged in the same cottage with me, I, of a surety, would have died of *ennui.*

One night—a stormy black night it was, too—I had gone to bed feeling wretched and miserable, for you must acknowledge that a long winter's evening with a lamp that splutters and a fire that smokes, and the only books within three miles of you "The Pilgrim's Progress," and Fox's "Book of Martyrs," is enough to make any one feel as if life was nothing but a desert.

I do not know how long I had been asleep, but it seemed not very long to me, when I was awakened by Jack hallooing at the top of his voice! "Turn out—turn out, old boy! Here comes the Wash!" Alarmed at the cry, the meaning of which I could not understand, I sprang out of bed only to utter a yell, and spring in again; I had jumped into three or four inches of icy cold water. At this moment Jack entered with a light, and his Wellington boots drawn over the legs of his trousers. He burst into a great laugh when he saw me rolled up in the bed shivering as if I had the ague. "Get up—get up at once!" cried Jack, as he scuttled after my shoes, that I could dimly see bobbing about in the water like small boats in a rough sea.

"But what on earth does it all mean, Jack?"

"It means that the German Ocean annually deluges this beautiful country; some say that it is a happy arrangement of Providence to save the farmers the trouble of manuring their fields, as the seaweed and sewage mud that the inundation brings with it enriches the soil so that little or nothing more is required. Some years the water does not come very far, but this year it's going to be a flood, and no mistake. Lucky thing for us, old boy!"

I shiveringly told him that I did not see where the luck came in; whereupon he explained that I could make a few pounds easily, and if I could manage to take one or two photographs of the "devastating element," as he termed the water, the illustrated papers would be sure to jump at them, while he (Jack) would write them up, and thus we would make a harvest out of a famine, so to speak.

It was quite evident that Jack had been expecting the Wash, for, close behind the cottage where we lodged, he had secured a flat-bottomed coble, and had engaged the services of the landlady's son to row us about. I shall never forget the singular scene that lay before us when the iron-grey light of morning permitted us to see the extent of the flood. As far as the eye could see there was nothing but water, from out which rose the tops of stiles, hayricks, stunted willows marking the sides of the dykes, submerged houses, and isolated wind-mills. The scene was dreary in the extreme. However, the inhabitants did not seem to take much to heart, as we could hear them joking and laughing in the upper rooms of their houses as we pulled along the London road. As we pulled along, Jack was busy with his tablets, taking notes. A child was crying in one of the cottages as we passed. "The cries of the terror-struck inhabitants were truly heartrending," muttered Jack, as he scribbled it down. A small stool and a hencoop were dodging about in the black water. "The amount of property destroyed can hardly be estimated," continued the truthful chronicler.

It was now broad daylight—such light as one gets about the first of December, and my part of the work had to be done now. I got a rapid rectilinear screwed on a 10 by 12 bellows camera, and took my first two plates on dry land; but the difficulty lay with the taking of the others, which had to be taken on the water. I was commencing to get sick of the job, for, independant of the chill easterly wind, it drizzled a nasty searching rain that rendered everything sticky, and gave you a most uncomfortable feeling; besides, the two negatives I had taken were such poor washy-looking things that I really felt ashamed of them. I meekly suggested the advisability of postponing the others until we could get a brighter light; but this Jack would not hear of. The pictures and his report must be sent off as soon as possible—it did not signify whether the pictures were good or not; all that was wanted was to give them a thorough idea of the scene of destruction; besides, the water might retire to the Ocean as quick as it had left it. This last argu-

ment decided me. So behold us once more in the boat—Jack taking notes under shelter of the tail of his coat, and I guarding my camera with a huge gingham that I had borrowed from a neighbour.

"Humorous episode," muttered Jack; "old lady at cottage door repelling the encroaching element with the aid of a dust-pan."

The spot where Jack suggested taking one of the views from was completely covered with water—as, indeed, the whole country at that side was. It commanded a view of a farmsteading—farmyard with its ricks, and a forlorn-looking windmill. To take this, I had to settle the tripod in about eighteen inches of water. Now, we had nothing to keep the boat steady. There was no tree or anything near us, and as the wind was momentarily increasing, I found it impossible to keep the pelting rain off my camera and focus at the same time. At last, in desperation, I leapt into the water, which took me over the knee, focussed, and exposed. Fancy exposing a plate while you protected your plate with a gingham! However, that was the best plate I took of the floods.

We now came to the last picture. I never felt so glad in my life, and I vowed that, be the negative good or bad, I would die sooner than try another plate. Tom, the boatman, was beginning to growl by this time—sounds that I hailed with delight. At length we reached the spot, and I put out the tripod, as before, and found that the water was nearly a foot deeper here. However, as I was drenched to the skin it did not much matter, so I stepped out of the boat—splash; down I went, some fifteen feet. I had placed the tripod on the edge of one of the numerous large drains, and had plunged myself into the middle of it. When I came to the surface, I heard Jack exclaim, "Tragic episode; narrow escape of an artist! Pick him out, Tom!"

I did not speak much after this incident. I sat around the fire, and did my best to dry my camera and clean my lens. Just before I turned in, I astonished Jack by asking him abruptly when the first train left for London.

"Why?"

"Because I shall be a passenger," was my reply.

And that was the last night I spent in the Fens, and it will be the last time I shall try to do anything for the illustrated papers. The pictures appeared next week; but Jack's description was so altered, that he honestly confessed he did not recognize it. I may mention that the few pounds never made their appearance.

ON THE PREPARATION OF GELATINE EMULSION.

BY ROBERT KNOTT.*

At the suggestion of the Hon. Secretary of the Manchester Photographic Society to explain the working of my injector for emulsions, which I did at the October meeting, and having made some observations relative to the preparation of emulsions, I have been asked to put together, if possible, the remarks I made at that time. I now make the attempt, and I hope that I may say will help a little. The injector exhibited was a ten-ounce one, consisting of a small bottle, an intermediate stopper, and a larger bottle. I will now give my process of making emulsion, using the parts of the inspector to illustrate my mode of working.

Into the smaller bottle I put 150 grains of nitrate of silver dissolved in six drachms of water. I then add by degrees liquid ammonia ·880 until the oxide of silver formed is redissolved and the solotion bright. In the larger bottle I place thirty grains of gelatine, 100 grains of bromide of ammonium, and five ounces of water. After standing for a time I apply heat to dissolve, heating the stopper bottles and their contents to a moderate temperature. The concave end of the stopper must now be placed upon the smaller bottle, then inverted into the larger bottle. The combined bottles are now grasped by the right hand, with the thumb pressed firmly upon the upper bottle, and in that position is agitated by percussion either upon the palm of the left hand or otherwise on a pad formed out of a handkerchief rolled up, ball shaped, until the silver solution is injected. A little more water may now be added to rinse out the remaining silver; then inject as before. It is important that the rubber rings are kept round the stopper to prevent jamming of stopper and bottle.

* Read before the Manchester Photographic Society.

Place the emulsion in a cool place to set; when in that condition break up the mass into small particles by means of a thin glass rod, filling the bottle with water at the same time. When it has settled, pour the excess of water off; repeat the operation three or four times, and finally tie over the neck a piece of fine muslin. Then invert the bottle to drain upon a thick pad of blotting-paper (which latter, after drying, may be used over and over again).

The emulsion must now be heated up to boiling point to remove the excess of ammonia; the olfactory nerve must determine that. Water is now added to make the quantity up to 10 ounces, together with the remainder of the gelatine, 170 grains. After standing for a time the emulsion must be heated until the gelatine is perfectly dissolved. The emulsion may now be filtered through wash leather or a funnel plugged with wool; it is then ready for use.

Why I use so small a quantity of gelatine is this:—I consider the sensitive germ of emulsion is as fully secured in the small quantity as in using the full quantity; and, also, if the perfect removal of the soluble salt from the emulsified gelatine assists in conferring greater sensitiveness, you are more likely to secure that end by dealing with as little gelatine as possible in the first instance. There is no doubt the sensitiveness of a gelatine film depends upon the formation of a species of gelatinate of silver, so to speak, just in the same way that Fothergill plates are prepared. By pouring albumen upon a partially-washed collodion plate you get superior sensitiveness, which is considered to be due to the formation of albuminate of silver.

My arrangement for warming the emulsion is by the usual decapitated, bottomless hock bottle with benzoline lamp, which I make serve two purposes—a light to work by, and the waste heat I utilize by placing at the top a hemispherical dish of copper, which I find most convenient for warming the emulsion dish and contents.

The next matter is measuring the emulsion for each size of plate. The spoon or ladle system of measuring I consider defective. As the emulsion requires to be stirred occasionally, it is impossible to do so without bringing about the "bubble" reputation, which is not very desirable, nor can it be avoided altogether; moreover, they cannot well be seen, owing to the opalescence of the emulsion. I find the use of a graduated glass syringe about the best for the purpose. There are two kinds of syringe known to the trade as "male" and female." The latter is the preferable one. It has a rounded end with a number of perforations in it; is a most useful appliance; it may be used as a stirrer; takes up the requisite quantity for each plate without any bubbles whatever, if taken from the lowet stratum of emulsion. It is also a useful distributor—quite as effective as a glass rod.

TO RENDER THE SILVER FROM AN OLD NEGATIVE BATH FIT FOR SENSITIZING PAPER.

BY T. STOKOE.

Pour the old bath solution into twice the quantity of filtered rain water, in order to throw down the iodide of silver, and filter. Add to the filtered solution, a solution of one ounce of pure carbonate of soda in half a pint of filtered rain water in successive portions so long as effervescence follows each addition, stirring well after each time of adding, in order to get rid of the carbonic acid gas which is liberated.

Put the precipitate into a filtering paper placed in a funnel, and wash with filtered rain water till the filtrate ceases to cause cloudiness when dropped into a solution of nitrate of silver.

Transfer the washed precipitate to a porcelain basin, place it over a saucepan of boiling water, and add pure nitric acid gradually until the precipitate is almost dissolved. Filter, bring down to proper strength by the argentometer, and, to secure a neutral bath, add a few grains of pure carbonate of soda, so as to cause a slight precipitate of carbonate of silver.

Note.—As carbonate of silver is sparingly soluble in water, or in a solution of nitrate of soda, do not throw away the water with which the precipitate is washed, but treat it with salt or hydrochloric acid to obtain the silver in form of chloride.

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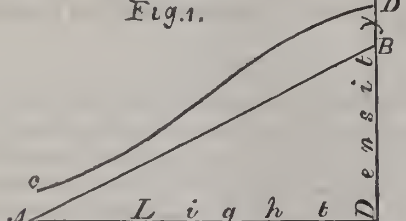
EFFECTS OF DIFFERENT EXPOSURES ON SENSITIVE PLATES.

It is a well-known fact that, even apart from considerations of colour, the gradations of tone in a photograph are not true to the original throughout the whole of their range. Notably is this the case in the high-lights and deep shadows where there is a want of detail, even when the best exposure is given; and this defect is much increased in either one or the other of these extremes when the exposure is either greater or less than what is known as the "correct exposure." The effect of too great exposure is want of detail in the high-lights; the effect of too short exposure, want of detail in the shadows. This, we say, is known to every practical photographer. Let us try to examine the matter more closely, and to represent graphically exactly how the case stands.

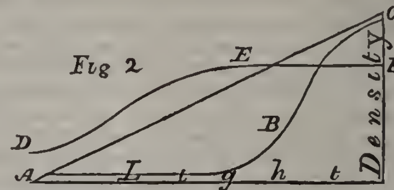
If we represent different amounts of light coming from different parts of a view which is to be photographed by distances along a horizontal line, and densities in the resulting negative by distances measured perpendicularly, from this line it is evident that if the resulting negative were true to nature—or, rather, displayed densities representing an exact converse to the gradations of light which reached it from the view—it would be represented by an oblique straight line, as A B (fig. 1), and would have any absolutely black object represented by clear glass.

Fig. 1.



We know from experience that this is quite impossible, as we can never have a fully-exposed plate in which there is absolutely no veil in the shadows. We should, however, have exactly the same print produced from a negative which was represented by any straight line parallel to and above A B; but, unfortunately, we cannot come even as near to a theoretically-correct negative as this. The nearest approach that we could have would be represented by a curved line, something like C D. Here we have graphically shown this shortcoming which we mentioned at the beginning of this article. We see at each end of the curve too near an approach to the horizontal, representing insufficient gradation of tone, whilst in the intermediate part we have too near an approach to the perpendicular, indicating that the half-tones of the negative show greater gradations than there are in nature. This represents the *nearest* that we can come to the truth with the best exposure that we can give. We shall now show by two other curves what are the effects of under- and over-exposure. Again taking our horizontal line to represent amounts of light, and our vertical line to represent density, we will have by under- and over-exposure curves like this—

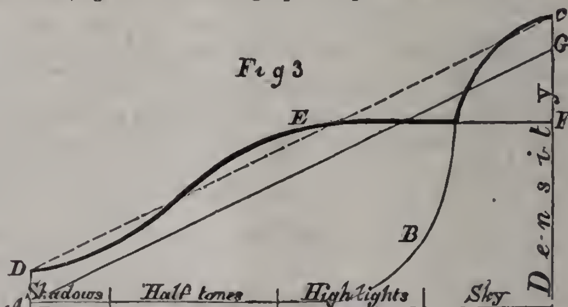
Fig 2



A, B, C, represents an under-exposed plate; here we see that for a considerable length the line is almost horizontal and very close to our base line. This is the representation of the large amount of bare glass, so familiar to us in an under-exposed negative, whilst the sudden rise of the curve shows the abrupt change from almost bare glass to considerable density, and the end of the curve shows the detail which we can always have in the high lights of under-exposed negatives, if we do not intensify them too much. In D, E, F, on the other hand, we see the effect of over-exposure. Here we have the line first rising abruptly, showing the abnormal amount of gradation or detail in the darker parts of the view; but, after a short time, it becomes almost horizontal, indicating the well-known want of detail seen in the high lights of an over-exposed negative, whilst the general flatness of the curve represents corresponding flatness in the negative. These curves represent the gradation of density resulting from a moderate range of light (say that which we would have in a well-lighted view) extending from absolutely black objects to moderately bright and well-lighted ones. Much beyond this range we cannot go without getting very false effects. To take the commonest example of the failure of photography to grasp more than a certain range of light, we have the impossibility of getting in one negative a perfect landscape and a perfect sky. If we attempt to do so, we shall have one of two effects. We shall have a negative which represents tolerably well the shades in the view itself up to the moderately high lights, but shows no trace of the clouds; or, we shall have a negative showing the clouds well, but having the view, all except a few of the high lights, represented by bare glass.

Here, again, we have a graphic representation of this.

Fig 3



In this case we suppose our horizontal line to include a much greater range of light than in the previous case, and we have marked along it approximately what shades of the view will be represented by different parts of it. Now notice the two curves. It will be seen that the defects are really the same as exhibited in the last two curves, but that they are greatly exaggerated; the one representing under-exposure for the view and correct exposure for the sky, is quite parallel to the base line until it comes among the high lights, then it abruptly rises, and in the sky shows all detail.

The other curve corresponds for its first part to the curve in fig. 1., and in the result of normal exposure for the view. Among the high lights, however, it gets too flat, and when it comes to the region of sky is quite parallel to the base line.

Now it is evident that each of these curves is approximately correct for a part of its course, and that if we should use the correct part, and disregard altogether that which is incorrect, we could have a tolerable representation of the whole range of gradation from the deepest shadows to the sky itself. This is, in fact, what is done in printing from two negatives, as in printing-in a sky. The darker parts of the two curves show how near we come to the truth by this double process. It must always be kept in mind that the straight line A, G (fig. 3.), or any straight line parallel to and above it, represents the gradations truly, so that by noticing how near the darkened parts of the curve are to the dotted line D, C, we can see how near we have come to a hypothetically correct negative. Wherever the curve is above the dotted straight line, the negative for that particular shade is too dense; where it is below the line it is too transparent.

We may mention that these curves are only approximate, as every kind of plate and every kind of developer will give a *slightly* different curve. They show, however, sufficiently nearly the effect of different exposures in any plate and with any practical developer.

Different kinds of plates will represent different ranges of gradation. The latest and now most popular plate—namely, gelatino-bromide—takes a greater range than any that has previously been used. So much is this the case that it is not uncommon to see a gelatine negative showing every cloud in the sky, whilst the view is but little under-exposed, and this without any recourse being had to shading the lens.

It must be kept in mind that a negative *representing great range of gradation* is a very different thing from a negative giving a print with great *range of tones*. The former means that great extremes of light and shade are represented in the negative with all their details; the latter that there is great *contrast* in the resulting print. This last expression would be better than the one commonly applied to a print. A negative may represent wide range of light and shade, and yet give a flat print.

We are always advancing, and one point at which experimental photographers might aim is the production of plates representing, as large as possible, a range of light. It seems to us that a little of the energy which seems to be entirely spent, at present, in trying for the utmost possible sensitiveness, might well be devoted to this cause. When we get, as there is no doubt we shall some day, films which will include the whole of the range of light which the eye perceives, then will photography come very much nearer to nature than it now does.

Since writing the above, we have heard that a peculiarity of Vogel's new emulsion is that it represents a very great range of light.

Notes.

To intensify a gelatine negative. Clear up the film by placing it in alum solution for an hour. Then intensify in a dish with any silver intensifier in ordinary use for wet plates. Fix again, and finally clear the film once more with alum.

Strict injunctions have been issued by the Home Office to the effect that a photograph of a prisoner's hands is in future always to be taken, as well as of his face; a man's fingers is the surest tell-tale of the nature of his work.

The members of the Photographic Club dine together next Wednesday at seven, at Ashley's Hotel, Covent Garden.

Mr. Bolas, some time ago, suggested the use of white porcelain vessels in the dark-room, as being more *visible* than transparent glass. A correspondent writes:—"On my laboratory shelf I now have a row of large white egg-cups, which are the most efficient developing cups imaginable."

A writer in the *Builder* calls attention to the employment of photography as a ready means of finding out whether or no a painting has been "restored"—the term usually employed by those given to tampering with pictures, good or bad. The sensitive plate detects the new pigment upon the old more quickly than the eye.

Her Majesty the Queen is not only noted for readily consenting to be photographed at seasonable times, but proves herself a valuable ally occasionally in inducing other grandees to sit also. The only occasion on which the Empress of Germany has been photographed was, it is said, at the express desire of the Queen; but even Her Majesty could not prevail upon the Imperial sitter to permit the picture to be published.

It is not generally known that light, and sunshine especially, acts energetically upon gun-cotton, and causes its decomposition. Red fumes—nitrous acid—are rapidly formed in a stoppered bottle containing pyroxyline in a dry state, supposing this to be exposed to full daylight.

The camera is likely, in future, to be included in the equipment of all special correspondents representing illustrated papers. The *New York Daily Graphic* equips many of its emissaries with photographic apparatus, and the *Illustrated London News*, on the occasion of the last Russo-Turkish war, also sent a correspondent to the front armed with a camera.

With highly-sensitive dry plates and quick-acting drop shutters, many a scene of interest is to be secured, which would be valuable if only to supplement the hand sketches sent home at the same time. The special correspondent would have no need to trouble himself about development, which could be carried out at home; the only thing necessary would be to scribble a few particulars on a tablet outside the dark slide containing the plate.

Engineers have always appreciated photography, and at the present moment several of the big engineering firms have photographic studios attached to their works. Sir William Armstrong, at Elswick, and Sir Joseph Whitworth, at Manchester, may be cited among others, while the eminent firm of gun-makers, Krupp and Co., in Westphalia, employ not only a photographic staff, but practise collotype printing and other elaborations of the photographic art.

When are we to have a national Photographic Portrait Gallery? The subject has several times been mooted, but, strange to say, never secured the faintest breath of encouragement. At first, we were told, it was necessary to get photographs that would not fade; and now these are to be had, a cry is raised against the unsatisfactory nature of the presen day photographs. In the meantime valuable negatives of bygone celebrities, which are in existence, are likely to get lost, or broken, or scattered through the breadth of the land.

Many of the great men who lived between 1840 and 1850 were depicted by the Daguerreotype process; but it would be hard work, indeed, to hunt up their pictures now. In some cases, the little plates, all stained and discoloured, have been cast on one side and forgotten, while coarse wood-cuts and engravings are treasured with care. But who would care to look at a big, black print of the late Sir Robert Peel, if he could see the statesman's living reflection clearly limned upon metal or paper, his bold features the same as when he lived, and moved, and had his being? The Iron Duke is very well in bronze and marble, but our children hereafter will be clamouring to see the hero of the Peninsula and Waterloo as he lived among men; not as a cold glazed statue, but with life and breath within him, with animated face and piercing eye, as the Daguerreotype or photograph alone can show him.

Every year that passes will make the collection of early Daguerreotypes more and more difficult, and it will be sad to reflect, when, one day, our tardy authorities take the matter in hand, that many of these living portraits have been lost to the nation for ever. Daguerreotypes, by the way, as many of our readers know, copy easily and successfully, producing far better results than are to be secured from silver impressions.

"A modern major-general," according to Messrs. Sullivan and Gilbert in the *Pirates of Penzance*, is a scientist conversant with all the isms, asms, and ologies under the sun. The late Duke of Wellington, however, did not consider it so all-important to be up in the very latest features of science, for there is a story extant of the simple old soldier paying a visit to Carpenter and Wesley's, in Waterloo Place, to see the solar microscope in the early days of that wonderful instrument. The Duke had repeatedly heard of the invention, but he could never persuade himself to forego his matutinal ride in the park to see it.

One morning, however, it came on so foggy that a ride was well nigh impossible, so he turned up Waterloo Place, and directed the groom to hold his horse while he dismounted. "We can't show the microscope to anyone this morning, sir," said the assistant. The Duke was not used to be thwarted. "What do you mean, sir? I am the Duke of Wellington! Pray, let me see it at once." And then the hero of Waterloo had to be informed by the grinning shopman that you can't look at the solar microscope unless the sun shines.

FRENCH CORRESPONDENCE.

Magic Photography—Electro-Metallic Photometers—Emulsion of Gelatine and Pyroxylin—Printing by Ferrous Oxalate—Tribute of Respect to M. Poitevin.

Photography by Magic.—A phosphorescent substance placed in a vacuum and submitted to the action of an electric current will emit a strong light. Why should the light thus produced not be used for taking photographic prints by the aid of some very sensitive medium, such as gelatino-bromide? A highly-amusing experiment might be made in this way, and one not less surprising to the audience, if they were told beforehand that no kind of light, either solar or artificial, was employed. What would be required would be some kind of flat receptacle from which the air could be exhausted; it must have a glass front behind which would be placed the phosphorescent surface, and be capable of being inserted in an electric circuit. The electric wires and battery could be concealed beneath the lecture table. The room having been sufficiently darkened to allow of the sensitive films used being manipulated without injury, the negative plate, and the sensitive surface on which the impression is to be taken, could then be applied to the glass face of the receptacle containing the phosphorescent substance; the whole is covered with a black cloth, and the current is turned on. In about five seconds an impression of the image would be taken, and the development, which would require a few minutes more, could then be proceeded with. This latter process might be effected in the same mysterious way. The printed paper is dipped into a covered basin, and the light is turned up again. In about two minutes, if not less, the paper might then be rapidly passed into the hyposulphite bath, and afterwards into water, and quickly dried on blotting-paper. By this arrangement a number of prints could be taken in a quarter of an hour, and could be handed round to the amazed spectators. The whole trick reminds one a little of the mysterious cabinet of the brothers Davenport, only there is no cabinet, and the spirits are not summoned; indeed, the effect might be heightened by declaring that the whole was managed by legitimate scientific means. The general idea is suggested to me by the circular of M Christian, who, it appears, actually does shut himself up in a cabinet, although, as I have shown, this piece of furniture is quite superfluous. An improvement might be effected by devising a sensitive paper possessing its own developer, so that it would be necessary, after exposing it, to plunge it into water. While on this subject, I may mention that I am at present engaged in experiments for taking positive impressions by development, and that I hope by this means to arrive at a rapidity of execution and a permanence which can be obtained in no other way. I reserve a detailed account of these experiments for the Year-Book.

Suggestion for a New Photometer.—Mr. Bell's experiments with his photophone have suggested to me an idea for an electric photometer. In Mr. Bell's instrument is utilised the property of selenium, when part of an electric circuit, to affect the resistance to the current according as this substance is acted on by light. Now, it seems to me that this property could be taken advantage of for a photometer. The apparatus would consist of a condensing lens, and a number of stops of different apertures, of a plate of selenium, or some other form of that metal, which would allow of the surface to be exposed being increased as far as possible. Further, if a dry electric pile and insulated wires be attached to the selenium, and, lastly, of a galvanometer, the light being now thrown on the selenium through the different stops successively, the indications given by the galvanometer corresponding to the diameter of the aperture of each stop would be first observed. Afterwards, using the same stop, the various indications of the galvanometer could be read off, corresponding to the different degrees of luminous intensity at noon, in full sunlight, in cloudy weather, with a declining

sun, &c. The arrangement would be better than the electro-chemical photometer of M. Ed. Becquerel, because there would be no chemical decomposition, as in that instrument, but merely the action of light on a substance whose electric condition it affects, but not its chemical composition. This action of light upon selenium must be an exceedingly delicate one, since the slightest vibrations produced by the voice on a vibrating mirror are faithfully transmitted in Mr. Bell's instrument to a bar of selenium, and by the electric current are again transformed into sound. An electro-metallic photometer of the kind I have indicated could also be used for regulating the electric current, which directs an instantaneous shutter. Combined with clockwork, it could be made automatically to regulate the length of the exposure. Thus, for example, if the time required for exposure in full sunlight were ten seconds, the instrument would, of its own accord, increase it to one of a minute when daylight was declining. In a word, it would measure the light, and only release the detent at the exact moment when the light had had the proper time to act to produce the necessary effect. The electro motive force could be transmitted to the clockwork by means of an electro magnet, and the mechanism would run more or less quickly according as the light might be more or less intense, until at a certain fixed point—just like the striking work of a clock—a cam would act and cause the shutter to drop. By this means the movement of the shutter could be accurately regulated to the small fraction of a second. All this, however, is only an idea, and depends entirely on the question whether selenium is sufficiently sensitive to the influence of slight variations in the luminous intensifier. But it is an idea which I propose to myself to work out, and, if others take it up at the same time, and work in a parallel direction, so much the better for the solution of the question.

An Emulsion of Gelatine and Pyroxyline.—Dr. Vogel's new emulsion has not failed to give rise to many interesting discussions and experiments. Several of our most indefatigable investigators have, as I happen to know, taken up the subject with great ardour, the consequence being, that some are unable to appreciate the new process, while others have nothing but praise for it. M. Konarzewski, a photographer of the South of France, has sent me the formula for an emulsion of his own, taking as his base the general idea suggested by Vogel's preparation. Into a mixture of fifty parts of alcohol at 36° Baumé (corresponding to a specific gravity of ·849) and 7·50 parts of glacial acetic acid, he introduces one grain of pyroxyline, which at once dissolves. This forms his standard collodion and to it he adds 10 grains of dry pellicle of gelatino-bromide. He places the whole over a water bath, and melts the gelatine by gradually heating the mixture, taking care to occasionally shake up the flask, in order to facilitate the emulsification. It appears to be a very simple formula which any one can try for himself. But, according to M. Konarzewski, there is no great advantage in using it, as the images taken on it require considerable intensifying, and there is also no possibility of removing the film from the plate. I content myself, therefore, with giving the account of the process as it has been transmitted to me, leaving to others, if they desire to do so, to prove or disprove what has been stated.

Photographic Printing in Iron Oxalate.—It seems surprising that the process of printing in iron oxalate is not more generally pursued, seeing that it offers so many advantages. After M. Poitevin first brought forward his ideas on the subject, M. Boivin published an account of a method to which, as he said, he was on the point of adding the finished improvement, but since then we have heard no more on the subject. Of the experiments of M. Colas, also, with iron gallate, nothing further has been heard. Working, however, with salts of iron must, in my opinion, surely prove to be a very economical method. If a piece of paper be sensitized with ferric oxalate, an image can be taken on it which will appear on development, for the action of light reduces the ferric to the ferrous oxalate, and on plunging the paper into a warm bath of neutral potassium oxalate, containing a little gold, platinum, or silver chloride, a precipitate of one of these precious metals is thrown down on the parts where the ferrous oxalate has been produced. The process, in fact, ought to be the same as the platinum process, with the exception of being much more economical, in so far as almost an infinitesimal quantity of the precious metal is employed; the object is that the latter should just coat the image, and not lie in a thick layer on it. It forms rather a toning, and we know how many proofs can be toned in a two-litre bath containing only a single grain of gold. As for the price of ferric oxalate, it can be left out of account.

Tribute of Respect to M. Poitevin.—M. Poitevin has now for some time resided at Conflans, where he lives a very retired life; he seems to have no desire to continue the researches with which his truly scientific mind at one time enriched our art. Notwithstanding his withdrawal from the world of Paris, however, he is not forgotten there. Very recently the Guild of French Photographers have, of their own accord, elected him in very flattering terms to be their Honorary President. This is certainly a more effective method of showing respect to an eminent scientific colleague than waiting till only his memory can be honoured.

LEON VIDAL.

Topics of the Day.

INTENSIFICATION OF GELATINE NEGATIVES WITH SILVER.

BY CAPT. W. DE W. ABNEY, R.E., F.R.S.

LATELY I thought that I had solved in a very simple fashion a problem which I had already solved in a more roundabout way. The problem was the intensification of gelatine negatives with silver in such a way as to avoid all chance of staining, and, at the same time, to render it possible to give local intensity, which, with all other methods, was simply impossible. It is not long ago that I described a plan with peroxide of hydrogen, and when sufficient precautions were taken, it was everything that could be desired; but then *precautions* had to be taken, and there was a lingering sense of danger always present when the intensifier was presented to the film, and the excitement (forgive the term when photography is in question) was sometimes a little too much. The only point which presented any difficulty in intensification with silver, was the destruction of the noxious hyposulphite compounds, and after trying many a re-agent, peroxide of hydrogen was the one which most strongly presented itself to me as the most suitable; but I forgot that in the gelatine worker's dark-room was another compound which acted equally well in destroying it.

Whilst away from home it struck me that by immersing a plate in the alum bath, after printing, all hyposulphite should be destroyed, and, on my return, the first thing I did was to test my idea. A plate was developed, and left purposely thin, then fixed, slightly washed, and placed at once in the alum bath. After a rinse with water, the ordinary pyrogallic acid and silver intensifier was applied; the intensity rapidly came, and by holding the plate in my hand, I was able to give local intensity just as I pleased. *Not a stain of any kind*, and the deposit was so beautifully black and fine. Practice had kindly consented to bear out theory. Eureka! I might have exclaimed, and worked away content, had I been a Greek; but being only Teutonic, I speedily tested half-a-dozen more plates, and all with the same result. A plate half immersed in an alum solution, after fixing, showed the destroying action of the salt admirably; the half not immersed took a lovely red stain; the other half was immaculate in the transparent parts. I then hunted up some old negatives which were

unprintable from thinness, and commenced operations on them, giving them quarter-of-an-hour in the alum bath, and then intensifying; only two were stained in the very least, and these not in the shadows, but in the high lights. These were two negatives which had been exposed in my laboratory for above three or four months, unvarnished and uncared for, and they evidently were sulphurized in a certain degree, exactly in a similar manner to other collodion negatives left in the same condition. These, as I say, slightly stained, but a rub with cotton-wool took off the deposit, and left them in their pristine state. The application of a little weak cyanide, as Mr. England suggested to me, would probably have got rid of the thin film of sulphide. Up to the present time I have rendered printable some fourteen or fifteen old negatives, which were kept in boxes, without a mischance, besides some thirty or forty transparencies and new negatives. On further experiment, which deserves notice, I had some old mercury-intensified negatives which had become whitened or yellowed, and which were unprintable on that account. Immersion in hyposulphite, and then in alum, rendered them fit to take silver intensification, and now they give vigorous prints. The success was so good that I communicated the fact to the Photographic Club. Before I quitted the meeting, a gentleman told me he thought he had read something somewhere regarding the same procedure, and gave me a reference. I hunted it up, and, behold! I had been forestalled by Mr. J. M. Carroll, in the last Almanac. He says, after alluding to Dr. Van Monckhoven's method of intensification :—"The same operator states that silver intensification stains the film red, and as I have not met with this difficulty except after imperfect washing, but have practised it for six years with success, proving it to be simple, certain, and permanent, I will describe my way of proceeding. The plate after it comes out of the fixing bath, is well washed, and placed in a saturated solution of alum for five or ten minutes, rinsed, and allowed to become dry. This is to remove the actively organic character of the film, which would otherwise cause a slight general obscuration, and prevent a perfectly brilliant result. It is useful, also, to ward off blistering, or subsequent injury during the operation. After soaking the dried film for a minute or two in water, apply the following solution, which is best done in a dish—

Pyrogallic	4 grains
Glacial acetic acid	10 minims
Distilled water	1 ounce

In half a minute, when the solution has opened the pores of the film, add from four to ten minims of a twenty-grain solution of nitrate of silver. This solution, whilst under perfect control, is yet rapid in its action, and will give intensity up to complete opacity. The colour of the film is good. Observe, I use no citric acid!" Could any pre-discovery be more complete? I only wished when I read the paragraph I had perused it eight months ago. I have, however, a few wrinkles to add. In my own experience it is better not to allow the plate to dry first, for then the intensifying solutions can be used by pouring on the film, no dish being required. Again, there is no objection to the ordinary pyrogallic acid intensifier. It is harmless in its action, and very rapid. I prefer, however, an iron intensifier, made as follows :—

Ferrous sulphate	5 grains
Citric acid	10 ,,
Water	1 ounce

The colour produced by this is very beautiful, and any amount of density can be given by it. Either a dried negative, or one still wet *after fixing* or washing, may be treated with the alum bath, and the result will be such as I have described in Mr. Carroll's words. I think this gentleman only partially describes the action of the alum. Alum (potash) is strongly acid, and rapidly decomposes hyposulphite, leaving any small trace of silver or soda salt in the film in innocuous forms. When hyposulphite of soda is present in the film, the silver nitrate combines with it to form hyposulphite of silver (in addition to what may already be in the film), the acid of the intensifier decomposes it, liberating a sulphurous acid, and a sulphide of silver is formed, which, though usually an opaque black when seen in bulk, is in a very thin layer of a reddish colour. Another function of alum is to prevent the intensifying solutions penetrating beneath the surface of the film, and we therefore get a surface intensification. The solution of alum used should be a saturated one, or, at all events, one very strong. Wherever hyposulphites are concerned, alum, it seems to me, is destined to play an important part.

My topic is ended When I proposed writing it, I was under the impression that I had something new to communicate. If others are as careless of reading as I have been in this case, it is new to them, so I do not apologise for bringing the subject prominently forward. I can only hope that others may be as successful as I have been, and that the use of alum after fixing may take away the reproach of the gelatine process, viz., the impracticability of giving local intensity to a negative.

The "Topic" for next week will be "Lions and Tigers before the Camera," by Thomas J. Dixon.

Correspondence.

A BICYCLE CAMERA.

Sir,—Can any of your readers give me information on this subject? I hear that there is such a thing made, and would like to know where to get one. Has any of your readers taken a bicycling tour with a camera? I had a half-plate camera with me for a few days in Derbyshire, but I found it rather heavy, and bruised my back after the first day's ride, so I packed it up and sent it home again. I exposed a dozen plates, however, and send you the enclosed of Haddon Hall.—Faithfully yours,

Brixton, Nov. 27th. J. Merreweather.

PHOTOGRAPHY OF THE LOWER REFRANGIBLE RAYS OF THE SOLAR SPECTRUM.

Sir,—In Captain Abney's highly interesting paper, read before the Royal Society, and published in your issue of November 19th, I find Dr. H. C. Vogel mentioned as the discoverer of the method to render bromide of silver sensitive to the lower refrangible rays of the spectrum by certain dyes which absorb the rays in question. Allow me to correct a personal mistake in that statement. I have a namesake, H. C. Vogel, renowned as an astronomer and spectroscopist, to whom we are indebted for many valuable observations. But the action of dyes on the sensitiveness of silver salts on the lower refrangible rays was not observed by him, but by your humble servant,

Berlin, Nov. 27th. Dr. H. W. Vogel.

CLOUD NEGATIVES ON WAXED PAPER.

Dear Sir,—I have a waxed paper cloud negative, and a very good one it is. I have used it four days out of six for the last three years, and, unfortunately, it has got marked with finger stains; the spots are dark, and, I think, are silver. Will hyposulphite take the silver stains out without damaging the subject, or a weak solution of cyanide? I should like to know if any of the readers of the Photographic News have ever cleaned such a cloud negative, and how to do it properly.—Yours,

Richard Huck.

INTERNATIONAL EXHIBITION, BRISTOL.

Sir,—In the News of the week before last, a slightly contradictory paragraph appeared, through printer's error, as to

the date for sending in exhibits. Allow me to remind your readers that the 6th inst. is the *very latest* day on which pictures or appliances can be received.—I am, sir, yours faithfully, H. A. H. Daniel, Hon. Sec.

Proceedings of Societies.

Liverpool Amateur Photographic Association.

The eighteenth annual meeting of this Associatian was held on Thursday evening, the 25th ult., at the Free Public Library, William Brown Street, the President, Mr. J. H. T. Ellerbeck, in the chair.

The minutes of the last meeting having been read and con firmed, the Secretary read the Council's

Annual Report.

"The Liverpool Amateur Photographic Association enters today upon the eighteenth year of its existence, and the Council have good reason to congratulate the members of the Association upon its continued prosperity and usefulness.

"During the past year six new members have joined our ranks, two have resigned, and one has been removed by death. As usual, therefore, the report is one of increase of number.

"A note of sadness cannot but pervade our review of the past year, at the untimely removal by death of our old—and to many of us, dear—friend, the late Secretary of the Society. This is not the place or the time to pronounce an eulogium upon the late Mr. W. Murray, but it is fitting that there should be recorded in the minute-book of the Association our unanimous respect for his memory, and our grateful sense of the genial kindliness and indefatigable assiduity with which he endeavoured to promote the interests and prosperity of our Association.

"The attendance of members at the monthly meetings has been rather above than under the average, and the meetings themselves have maintained their character for interest and practical usefulness.

"Two papers only have been read during the year—one by the President, Mr. Ellerbeck, on 'Practical Directions for the Regulation of the Duration of Exposures;' and one by the Secretary, the Rev. H. J. Palmer, on 'Gelatine Films as a Substitute for Glass.'

"The out-door meetings and excursions of the Association have been of more than their wonted interest and enjoyment, and have resulted in the production of large numbers of artistic pictures. Excursions have been made to Shrewsbury and Haughmond Abbey; to Ruabon and the banks of the Dee; and to Much Wenlock and Buildwas Abbeys. Out-door meetings were held at the house of Mr. W. H. Wilson, St. Michael's Hamlet, and at Wallasey, at the house of the Rev. H. J. Palmer.

"Among the exhibits of interest which have been produced during the year at our meetings may be mentioned the harmonograph, by Mr. H. N. Atkins, and instantaneous shutters, by Messrs. Kirkby and Roberts.

"The Council have selected a number of negatives by members of the Association, from which eighteen will be chosen by the Woodbury Company, and printed by the Woodburytype process, for presentation to the members of our Society.

"The thanks of the Association are due to the Library, Museum, and Arts Committee of the Corporation of Liverpool, for their kindness in granting us the use of the room in the Free Library in which these meetings are held, and also to the Photographic Society of Great Britain for sending copies of the Journal."

The Treasurer then read his report of the financial position of the Association (his balance sheet having been audited by Mr. Wharmby), and congratulated the Association on having a large balance on the right side of the account.

The following officers were then elected for the year 1881:—

President—W. H. Kirkby.

Vice-Presidents—E. Roberts and B. Boothroyd.

Treasurer—E. Twigge.

Hon. Secretary—Rev. H. J. Palmer, M.A.

Council—Rev. T. B. Banner, J. H. T. Ellerbeck, T. Clarke, W. E. Potter, J. W. H. Watling, H. A. Wharmby, L. W. Weber, Dr. Kenyon, W. Bruce, E. Phipps, A. Tyrer, and W. H. Wilson.

The Chairman briefly congratulated the Association on the favourable character of the reports of the Council and Treasurer; but expressed his regret at the paucity of papers read at the meetings during the past year, and earnestly hoped that 1881 would witness an improvement in this respect.

The Secretary announced that a number of negatives by members of the Association had been chosen by the Council to be sent to the Woodburytype Company, and that from these a final selection of eighteen would be made and printed by the Woodbury process for presentation to each member of the Association.

Mr. A. Tyrer offered three fine 12 by 10 negatives to be used as an addition to the selected eighteen; but the meeting, while proffering their hearty thanks to Mr. Tyrer, decided that it would be preferable to accept this offer for another year's presentation prints.

The Secretary said that he had received a communication from the Secretary of the Associated *Soiree* of Scientific Societies, offering the use of the grand jury room at St. George's Hall for an exhibition of photographic pictures and apparatus by members of this Association.

After some discussion, it was agreed to exhibit largely at the forthcoming *soiree;* but objection was raised to the room offered for the purpose, on the ground of its inaccessibility, and the Rev. H. J. Palmer was requested to write to the *Soiree* Committee to that effect.

A resolution was proposed by the President, and seconded by the Secretary, that the rules of the Association, a list of its members, together with the names of the past and present office-bearers of the Society, shall be printed forthwith and distributed. This was unanimously agreed to.

With the view to the necessary arrangements for the associated *soiree*, it was decided to hold the next meeting on Thursday, the 16th inst.

The exhibits of the evening were some instantaneous exposures by Messrs. Ellerbeck, Day, and Wood; some fine platinotype prints, by Dr. Kenyon; Cadett's instantaneous apparatus, by the President; a negative successfully exposed and developed on a Mawdsley plate fifteen years old, by Mr. Day; some negatives of portraits taken at night with magnesium wire, by Mr. Ellerbeck; a fine negative of an instantaneous subject, by Mr. J. A. Forrest; and some prints by Messrs. Cockhill and Wood.

The meeting was adjourned until Thursday, December 16th

Talk in the Studio.

The Royal Society and Photography.—On St. Andrew's Day the President of the Royal Society, in accordance with ancient custom, reviewed the scientific progress of the year. He alluded several times to photographic work in the course of his address, and these allusions we append:—"A method of recording the duration of bright sunshine by the charring of an object placed in the focus of a glass sphere, freely exposed to the rays of the sun, was devised by Mr. J. F. Campbell, of Islay, in 1856; and instruments, being modified forms of that originally proposed, have been employed for some time at Greenwich, at Kew, and at a few private observatories. Certain difficulties in adjusting the paper about to be charred to the path of the burning spot, which had hitherto prevented the adoption of Mr. Campbell's invention as a part of the ordinary equipment of a meteorological observing station, have been at last successfully overcome by an arrangement designed by Professor Stokes; and thirty stations in the British Isles have now been supplied with instruments of the pattern proposed by him. We may thus hope to obtain in future a sufficient record of a meteorological element, which is of primary importance in its relations to agriculture and to the public health, but which has hitherto been very imperfectly registered." Turning to the question of spectrum analysis, the President pointed out how the study had become complicated by two sets of facts. Firstly, the increased dispersion, the improved definition, the enlarged electrical power at our command, and, above all, the substitution of photograph for eye observations, have revealed to us an almost overwhelming array of lines belonging to each substance: secondly, the same means have shown that many substances present different spectra when in different molecular states. From the series of Greenwich photographs of the sun, 1874-1879, the mean heliographic latitude of spots, and mean distance from the sun's equator, have been deduced for each rotation and for each year. A fine thirty-six inch silver-on-glass reflector has been recently constructed by Mr. Common, and with this instrument he has obtained photographs of Jupiter, showing the red spot, and of the satellites. One Royal medal has been awarded to Professor Joseph Lister, F.R.S. Mr. Lister's claims to the honour of a Royal medal are based upon his numerous and valuable contributions to physiological and

biological science during the past thirty years. Condensed into a single senteuce, the merit of Mr. Lister consists in the generalization to living matter of the results obtained by Schwan aud Pasteur with dead matter. He refers to the researches of Pasteur, and shows their bearing upon surgery. He points to the representative fact then known, but unexplained, that when a lung is wounded by a fractured rib, though the blood is copiously mixed with air, no inflammatory disturbance supervenes; while an external wound penetrating the chest, if it remains open, infallibly causes dangerous suppurative pleurisy. In the latter case, the blood and serum are decomposed by the microscopic progeny of the germs which enter with the air; in the former case, the air is filtered in the bronchial tubes, and all solid particles are arrested. Three years subsequently this inference of Professor Lister was shown to be capable of experimental demonstration.* The Rumford medal has been awarded to Dr. William Huggins, F.R.S. A subject to which Dr. Huggins has more particularly devoted himself of late is the mapping of the photographic spectra of stars. This was a research of great delicacy, partly on account of the small quantity of light at the disposal of the observer, partly from the great accuracy with which the comparison had to be made with the spectra of known substances, in order that satisfactory conclusions should be deducible as to the presence or absence of such or such substances in the stars. The results obtained led to a remarkable division of the stars into two great classes, naturally with transition cases, namely, white stars, which showed a group of twelve dark lines, belonging, apparently, to the same substance—probably hydrogen—and the group of stars of which our own sun may be taken as a type.

* Dr. Koch's micro-photographs bear on this discovery.—Ed. P.N.

To Correspondents.

W. Buckley.—The reproduction of paper prints by the kind of method you mention is not calculated to yield high class results, but you may obtain fairly satisfactory copies by care and attention. First remove the print from its mount by soaking in water, then dry, and lay on a warm metal plate; after which, rub with a piece of white wax, so as to render the paper semi-transparent. Lay this transparency in a printing frame, place a gelatino-bromide plate behind it, and expose (say) for five minutes at a distance of twelve feet from an ordinary gas-burner, develop, and use the resulting negative. As regards formulæ and instructions for working the gelatino-bromide process, see Captain Abney's book, which is published at our office, or obtain our forthcoming Year-Book.

Bromide (Preston).—It is generally wise not to expose the plates to white light until the fixation is complete, and we suppose you do not attend to this point, or you would have no means of knowing that the films are very yellow before fixing. The veil you refer to may arise from a variety of causes, among which may be mentioned the following:—Undue exposure of plates or emulsion to light; insufficient exposure, and consequent forcing during development; fumes of ammonia in preparation room; over-cooking of the emulsion; dirty vessels or filtering cloths; excess of silver. You should try using more pyrogallic and less ammonia for development.

Photo.—Pellet's process gives admirable results, and a little practice will enable you to work it very successfully. An exceedingly well-sized paper is floated for a few seconds on the following solution:—

Water	100 parts
Perchloride of iron	10 ,,
Oxalic acid	5 ,,

The solution must be kept very carefully in the dark. When the paper is dry, an exposure of two to ten minutes is given under the plan to be copied. After exposure the print is immersed in a 15 per cent. solution of ferrocyanide of potassium. In a few seconds the image is fully out, and after a thorough washing the proof is fixed in a bath of dilute hydrochloric acid—one of acid and ten of water. After this a thorough washing is all that is required. The great point is to confine the sensitive iron salt to the surface of the paper, as otherwise it is impracticable to obtain a clear white ground. Hence the necessity for a paper so well sized as to prevent the penetration of the solution. If you wish to work the process commercially, you must arrange with the patentee's agent, Mr. G. E. Chapman, 113, Victoria Street, Westminster. The sensitive paper is supplied all ready for exposure.

R. Shipton.—Potassium iodide, when quite free from all impurity, soon turns brown from the liberation of iodine. The commercial salt usually contains carbonate of potassium, and retains its whiteness even when exposed to air and light.

Triplexicon.—1. Very satisfactory transparencies for the lantern can be made by means of the collodio-chloride of silver. Use plain glass, and wash at the stage you mention. 2. The best process for you to employ is undoubtedly the carbon or Autotype process. No licence is required for making lantern slides, and you had better make use of a tissue giving a brown or purple tone—that sold as special transparency gives a cold black, with a cast of green, and is specially useful for transparencies intended for enlargement. One great point in making transparencies is to take care to dry the tissue thoroughly. Develop on collodionized glass—which, by-the-bye, is all the better for having been previously albumenised. Obtain the Autotype Manual for further instructions. 3. A plate of glass is waxed slightly, and coated with collodion. When dry, the coated side is flooded with a hot 10 per cent. solution of gelatine, and an ordinary albumen print is squeegeed down on it. The print, being now allowed to dry, is stripped off, carrying with it the collodion film.

A Puzzled Amateur.—1. You have evidently not kept your prints in motion during the operations of toning and fixing. How can you expect the solutions to act uniformly if the prints are allowed to remain for any length of time in partial contact? 2. There appears to be no real advantage in using the toning baths you mention, and as your failure has risen rather from your manipulation than from the bath itself, you had better stick to your old friend.

M. B.—1. First size with a 6 per cent. solution of gelatine in water, and when the sheet is quite dry, varnish with copal varnish. 2. Try equal parts of alcohol and water.

H. Bradshaw.—At Messrs. Hopkin and Williams, Cross Street, Hatton Garden.

C. G.—See list in forthcoming Year-Book. Surely you cannot expect us to give you the scale of charges for advertisements in all the photographic publications of Europe!

George C. Hance.—So much depends on local circumstances. See past volumes of the Year-Book.

A. B.—The deposit of copper is merely intended to give stability to the tin-foil.

H. Spink.—1. A layer of emulsion, a quarter of an inch thick, would require a longer washing than you propose giving. Better force it through canvas. 2. Try the experiment, and report the result.

The Photographic News, December 10, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

LONDON FOG AND PHOTOGRAPHY—A NEW METHOD OF PRODUCING BACKGROUNDS—THE QUEKETT MICROSCOPICAL SOCIETY.

London Fog and Photography.—Photographers should be greatly interested in the fog and smoke question which has been lately brought before the public as though it were a perfect novelty. Scientific men may talk as they will, but it is greatly to be feared that we shall have the fog, like the poor, always with us. Abolish smoke, abolish even fires, and London would yet have its mists, though not, perhaps, the yellow, stinging "London particular." The winter time is really a serious and an anxious time for London photographers. If one could afford it, the most satisfactory way would be to close the studio for four or five months, and recruit oneself at Torquay or Madeira for the busy season when the photographer has no peace. But this, of course, is impossible, and the next best alternative is the artificial light. The wonderful success of Mr. Swan's electric lamp shown at the Society of Telegraph Engineers a few evenings since makes one look to him as the man who will come to the photographer's rescue. We suggested, immediately after the announcement of his improved lamp at his lecture at Newcastle, that he should demonstrate the powers of the lamp at the Photographic Society. We still hold to this suggestion, and would go further. Why not make the demonstration a photographic one? An easily-worked electric light, soft and yet brilliant, as Mr. Swan's appears to be, is what photographers want. How heartily welcomed such a demonstration would be, goes without saying. Practical photographer as Mr. Swan is, ever keeping an eye upon anything which can advance the art, he could not have rested contented without trying the applicability of his lamp to photographic portraiture, and must have a good deal to say on the subject which would be worth hearing. If photographers could be only made independent of fog and smoke, what an immense boon it would be! As Mr. Swan's lamp is capable of producing a light equal to sixty candles, though he is contented with one equal to thirty candles, this ought to answer all purposes.

A New Method of Producing Backgrounds.—An American paper has unearthed a novelty, which it heads with the appropriate title of "new." The journal in question says something new in the way of photographic background is announced. It is based on a well-known "retouching" process—that pleasing method of manipulating the negative so that all unprepossessing features are toned down. By this new device for backgrounds no scene-shifting on the part of the operator is necessary. The victim is pinioned as usual, and the negative taken. The artist then "retouches" an appropriate background on the glass plate, which duly appears on the photograph. Backgrounds can thus be put in to suit the taste. A young lady with a talent for sketching can draw a pretty piece of scenery, and the photographer can have her picture taken with the sketch as a background. Those who have pictures of their old homes can be photographed standing in front of the ancient residence, and school girls can pose nicely before their academies, and learned graduates before their colleges. In fact, this new wrinkle is capable of many transformations, and will, no doubt, be the rage for a while. The method, however, is not so novel as the writer supposes. This way of putting in backgrounds is a very old one, and has been worked with more or less success—generally less. Clouds in landscapes are the most effective things which have yet been done in the way of working on negatives, but even these require more technical skill than is usually possessed by "a young lady with a talent for sketching."

The Quekett Microscopical Society.—The President of the Photographic Society must have been intensely amused at the annual dinner of the Quekett Microscopical Society, at which he was present on Saturday week. There is some difficulty, it appears, in editing the Royal Microscopical Society's Journal, as the active Fellows of the Society formed two distinct parties—those who thought the Journal should be devoted to the microscope proper, and those who thought its pages were better occupied with the applications of the microscope to natural history. The supporters of the latter dubbed their opponents as the "brass and glass" party, while the natural history amateurs had been politely designated as the "slug and bug" party. Mr. Crisp, the junior Secretary, upon whom the task of editing the Society's Journal fell, observed, in responding to the toast of "The Royal Microscopical and Kindred Societies," that the "brass and glass" men yawned terribly whenever points of anatomy were being discussed; while, when the other side had its innings, and exhibited or described new forms of stands and apparatus, the "slugs and bugs" could hardly restrain their impatience. This statement was received with great laughter, only increased when Mr. Crisp went on gravely to refer to himself personally as a "brass and glass" man, whilst he ventured to regard the senior Secretary (the chairman of the evening) as a type of a "slug and bug" man. What a charmingly happy family the Royal Microscopical Society must be, and how Mr. Glaisher must congratulate himself upon the fact that the Society of which he is President has not yet divided itself into "wet" men and "dry." Not but what a little humour thrown in now and then would not altogether spoil the somewhat solemn debates of the Photographic Society of Great Britain.

The City and Guilds of London Institute and Photography.—The City and Guilds of London Institute is doing much to remove from the City companies the reproach that they spent their money only in feasting, and were indifferent to the objects for which they were founded. It may be said that they are now going beyond these objects, as we have never heard of the Photographers' Company, and yet photography is one of the subjects which the Institute fosters. The questions for the examinations to be held in May have been issued, and those who intend going up had better lose no time in joining the Wednesday evening classes which were commenced in October, and are now being continued at Gresham House. The prospectus states that students in these classes should chiefly devote themselves to the study of spectrum photography, and of emulsion paocesses, so that poor collodion would appear to have been completely shelved. It must be confessed, however, that the money's worth is given, since the fee of five shillings the term is all that is asked for a lecture every week lasting two hours and a half. Who would not learn something about theoretical photography for so small an expenditure?

At Home.

THE PLATINOTYPE COMPANY AT BROMLEY ROAD.

As on former occasions, there has this year been a good deal of discussion over the medal awards at the Pall Mall Exhibition. But, however much the deserts of this or that fortunate recipient have been called into question, unanimity appears to exist on one point, that the medal awarded to the Platinotype Company is thoroughly well deserved. The beautiful reproduction by Mr. F. Hollyer of a work of Mr. Burne Jones, the "Marble Hall" of Mr. Manfield, a masterpiece of interior work, the woodland studies and landscape pictures, which together afforded abundant proof of what platinotype can do, constituted, this year, one of

the best features of the Exhibition. Artists were loud in their praises about the colour and delicacy of the prints, and experienced photographers were fain to admit that, if the subject and the negative are fit, platinotype printing leaves nothing to be desired.

No doubt there is much to be done in the process, before we can hope to get the same range of results as we do in silver printing. A bad negative, or an indifferent one, is best printed in silver; since you can see better what you are doing, you can control and dodge the better. For this reason, silver is, and will ever remain, a favourite process; but given a good negative, then platinotype may be used with advantage in a great many respects. It is true, that if you compare two prints from a fine negative, the one in platinum and the other in silver, the former, as a result, is still behind the latter, in the opinion of some photographers; but then comes in the balance of advantages. Although, as a photographic result, the silver print is to be preferred, the delicate warm grey tone of the platinum impression goes for much with a large number of people, and with painters and artists in particular, who hold it in high favour by reason of its fine engraving-like aspect. Moreover, as much by reason of its tone as on account of the unglazed surface of the print, the platinotype is thoroughly well adapted for artistic colouring.

But the principal advantage of platinotype is its permanence. Mr. Spiller has made a searching investigation of the matter, and his opinion is that the print will last as long as the paper. His plan of testing the prints he thus describes:—

"Some of the prints were cut into sections and separately treated, so that the portions could afterwards be patched together again for comparison, when any loss of vigour or alteration of tone would become at once apparent.

"In this way I have tried the action of all the common acids, using these of such degrees of strength as seemed fair to the paper basis of the photographs. Thus, the nitric acid was diluted with an equal bulk of water, and sulphuric acid with three measures of water; but hydrochloric acid, having itself so little action upon paper, permitted of its being employed in the concentrated form. After an hour's immersion not one of these acids exerted the slightest action upon the platinum prints, nor did weak caustic soda, sulphurous acid, hyposulphite of soda, strong ammonia, or cyanide of potassium. The last-named reagent draws a sharp line between a platinum print and an ordinary gold-toned photograph, showing a clear distinction in favour of platinum black as against reduced gold, and negativing a direct assertion on this head by Dr. Van Monckhoven:

"With regard to chlorine, I found, much to my surprise, that a slip suspended within the neck of a flask from which chlorine gas was freely disengaged suffered no harm; nor even in another trial when, by accident, the print fell into the acid liquid from which the chlorine was being evolved. Further, I am prepared to say that nascent chlorine does not affect the platinotypes unless the conditions are very severe, or such as to bring about an actual disintegration of the paper, as by an attack of warm aqua-regia."

But we must proceed to describe the process. Mr. Berkeley, who is one of the directors of the company, has some prints at hand that have just come from the frames, and these we examine in a subdued white light. "You know the process perfectly well, of course," says Mr. Berkeley. "Of course, of course," is our reply, and then we hesitatingly add in effect, after the manner of the Bourgeois Gentilhomme, "*mais faites comme si je ne le savais pas.*"

Mr. Berkeley is good enough to accede to our wish. "This, you see, is a roll of paper as we receive it," he says. Since it is a roll some five feet broad and a yard or two thick, there is no difficulty about seeing it, and we at once say so. "Only Saxe paper is employed, and this comes direct from Steinbach," and then Mr. Berkeley proceeds to say how it is prepared for platinotype purposes.

After a preliminary sizing, a coating of ferric oxalate and platinous chloride is applied to the surface of the paper by means of a brush or pad, the work being done by girls, who are more light-handed than men. The platinum salt employed is that most easily reduced, and the paper is now sensitive to light and fit for issue. But platinotype has one arch-enemy, and that is damp. If you will only keep the paper dry, and all things that come in contact with it, your printing will be a success; but not otherwise. There is little difficulty about doing this, if you will follow the instructions of the Company; a tube or cylinder of tin is a handy utensil for storing paper or prints, the cylinder having at one end a receptacle for chloride of calcium, while as to keeping the paper dry in the printing frame, this is done by the simple precaution of putting a soft rubber pad or sheet over negative and paper.

The sensitiveness of platinotype paper is calculated to be about three times that of chloride of silver paper, but you cannot watch the progress of printing quite so well. The image is very faint, and it is not until the printer has had a little experience that he can judge accurately. The difficulty is one, however, easily surmounted, and, moreover, when it comes to the development of the print, you have the means at hand to correct over- and under-exposure.

To development Mr. Berkeley now proceeds:—A solution of oxalate of potash is heated in a flat dish to 170° or 180° F. If the prints are under-exposed (the first print of the batch is a good tell-tale), then the temperature is raised; if over-printed, the developer is used less warm. Mr. Hollyer—one of the masters of platinotype printing—sometimes employs the bath only tepid, taking half a minute to develop a print. But, as a rule, the picture is developed instantly. No sooner have you placed the phantom brown image, face downwards, upon the warm solution, than a bright vigorous picture starts into view—a dark grey print, forcible and strong, and yet possessed of that softness and delicacy which make platinotype so beloved by artists.

There is no toning, fixing, or even washing in the ordinary sense of the term. A water bath acidulated with a little hydrochloric acid receives the print, which, after a minute or two, is lifted into a second, and, may be, a third similar bath. The object is to discharge all the iron salt remaining in the paper, and as soon as the baths have no longer a yellow tint, the washing may be discontinued.

Of what is the finished image composed? it may be asked. Pure platinum, in the form that is known as spongy platinum, or, rather, platinum black; in a word, the finest state of division in which that metal occurs. Metallic platinum, as everybody knows, is one of the most stable of substances, and, therefore, there is little fear of any change taking place on account of contact with chemical substances that may come near the film. That is to say, the platinum is not likely to change; but since platinum black is known to chemists as possessing strong catalytic action (the power to induce decomposition in another body without itself undergoing perceptible alteration), any substance in contact with it might not share the same immunity. Stephenson's well-known rejoinder to the question what would happen if a cow got upon his new railway, "So much the worse for the coo," might well be paraphrased here, for, apparently, in the case of any chemical body coming near a platinum print, the resulting danger would be only to the body in question. For all this, however, no pigment has ever been found to change on application to a platinotype.

The developing liquid—oxalate of potash solution—is employed over and over again, and must not be thrown away, since it contains after use a good deal of platinum that may be recovered in the form of residue as easily as silver is from washings in the ordinary printing process. In the same way, trimmings and cuttings of the paper are

valuable, and should not be thrown away. The prepared paper has a yellowish tint, and for this reason the laboratory or printing-room should not be illuminated by yellow glass; a feeble white-light is far preferable.

As most of our readers know very well, vignetting and fancy printing is as easily conducted with platinotype as with the chloride of silver process, the results, in every case, possessing the cold grey tone inseparable to platinum. This tone, however, much as the absence of much warmth may be regretted, is at a premium with book-publishers, by reason of its harmony with letter-press and engravings. Silver prints never harmonise well with type, but platinotype does so very perfectly.

Mr. Berkeley was good enough to show us some examples of platinotype enlarging, sent over from New York by Mr. Willis, to whom we all know the elaboration of the process is due; these enlargements were secured from small negatives by the aid of electric light, and were exceedingly satisfactory, both in respect to vigour and detail.

The "At Home" next week will be "The Vander Weyde Electric Studio in Regent Street."

FRENCH CORRESPONDENCE.

Meeting of the Photographic Society of France—Paper Plates—Dr. Vogel's Emulsion—New Transfer Process—Selenium Photometer—Portrait of Fox Talbot—Experiments with Phosphorescent Substances—Lectures at the Sorbonne.

Meeting of the Photographic Society of France.—We had a very interesting, and more than usually well-attended, meeting of our Photographic Society on the 3rd December last. A letter from the Mayor of Chalons-sur-Saône was read, informing the Society that the eminent sculptor, M. Guillaume, Member of the Institute, a former Director of the Fine Art School, and ex-Director of the Fine Art Department of the Ministry of Public Instruction, had offered his gratuitous services in executing the statue of Nicephore Niépce. This liberal offer puts an end to what at one time threatened to be a serious difficulty in the way of accomplishing what is nothing but an act of justice.

M. Balaguy's Pellicle.—Several competitors have already presented themselves for the Gaillard prize, which is offered for the production of the best dry plates in pellicle: one of these competitors is M. Balaguy. At the meeting of the Photographic Society, he gave a general outline of his process, without, however, describing the details closely. His sensitive film is on paper. The paper is prepared by first stretching it on a glass plate, to which it is no doubt made to adhere by a caoutchouc varnish, and by this means it can be collodionized with the gelatino-bromide, as well as dried, without suffering any deformation. It can be easily stripped off the glass, and is then produced in the form of sensitive pellicle. It is developed in the ordinary way, and if it be desired to have a pellicle without paper, it can be pressed with its gelatine side against a glass plate in its wet state, and the paper can then be removed from the support. M. Balaguy did not mention how this operation should be performed, I will therefore say no more about it; but I have a strong belief that he effects it by interposing caoutchouc varnish between the layer of emulsion and the paper. This is, however, nothing more than a guess on my part.

Dr. Vogel's Emulsion.—M. Schaeffner laid upon the table a number of bottles of this new emulsion, made from pyroxyline dissolved in acetic acid to which bromised gelatine had been added. He exhibited, also, some very fine plates and prints taken with this emulsion. I am surprised to find no one has yet given an authoritative opinion on this new product, and I am consequently unable to give an account of the views on the subject entertained by my colleagues. All the bottles of emulsion presented at the meeting were distributed among the members, that they might try experiments with the new compound, and the results of these experiments will, I have no doubt, be reported at the next meeting of the Society. *Apropos* of this emulsion, a sanitary question was raised at the meeting: the use of acetic acid was stated to be injurious to health. I am, however, persuaded that, if the danger really exists, its effect has been very largely exaggerated. Acetic acid has been used for a very long time in the production of photographic preparations, and I never heard yet of its having deleterious properties.

A New Transfer Process.—M. Fish, of Lyons, communicated a method of making transfers of line drawings on silver or copper, without the use of light in the second transfer, after that a print has been first taken, as in the carbon process. The substance which he employs, of which he gives no detailed account, is flowed over the paper like an ordinary emulsion. It is sensitized by means of potassium bichromate, and, after being developed and dried in the usual way, the image is applied to a well-smoothed plate of silver or copper. At the end of about an hour, the action of the substance which forms the image is shown by the appearance of a brown tint on the metal, reproducing exactly the drawing. It is caused, no doubt, by a sulphuration or some other chemical modification of the metallic surface. The same print on paper will give, according to M. Fish, any number of transfers by contact. At the Ministry of War it is intended to use this process for producing maps on copper, ready for the engravers to work on with the burin. The change undergone by the metal constitutes a sort of electric insulation, and a plate treated in this way can be electrotyped, a deposit of metal being obtained on the parts not affected. This process, when further improved, promises to be of great value.

A Selenium Photometer.—As an appendix to a communication on the subject of Graham Bell's photophone, I gave the meeting a summary account of my initiatory attempts to construct a selenium photometer for photographic and meteorological purposes. My experiments have hitherto been very successful; the sensitiveness of the instrument to the faintest rays of light is very great, and I have the best hopes to realise by means of it results of great interest. What strikes me very forcibly is the possibility of being able to supersede entirely the photometer formed on the principle of chemical combination or decomposition. I cannot, however, deny that my experiments have been from the very first of extreme delicacy, and very costly; but the principle being a sound one, I have sufficient courage and determination to pursue them to the end. I do not belong to the school of those who try to build Rome in a day.

Portrait of Fox Talbot.—A portrait of Fox Talbot, taken in photo-engraving, by M. Dujardin, was presented to the Society; in a short time, no doubt, copies will be published. This tribute of respect to the memory of your celebrated countryman, the third father of our art, is happily rendered simultaneously with the erection of the memorials to Niépce and Daguerre—another proof that science knows no limits of frontier.

Experiments with Phosphorescent Substances.—M. Warnerke, when investigating the ingenious phosphorescent photometer recently described in the Photographic News, observed that the phosphorescent sheen was rapidly extinguished by means of a green-coloured translucid screen. This observation of his is quite correct, and the same thing happens when yellow and red-coloured screens are used. It is only, however, true in the case of white light. I illuminated some calcium sulphide with an ordinary lamp, and obtained a very beautiful phosphorescence,

and on covering the surface with films of various colours —green, yellow, and red—I could find no extinction, no doubt because the artificial light was yellow in colour, and not sufficiently actinic. Repeating the experiment with the magnesium light, I succeeded in extinguishing the phosphorescence, as in the case of daylight. Seemingly unimportant facts have often their value, and this is my reason for recording these observations, trifling as they may appear.

Lectures at the Sorbonne.—M. Davanne will recommence his course of lectures on photography at the Sorbonne about the middle of January. As on the previous occasion, he will be assisted in his illustrations by M. Chardon.

Leon Vidal.

NOTES AND EXPERIENCES IN PHOTOGRAPHY.

BY C. J. BURTON.*

Mr. Chairman and Gentlemen,—I propose to read you a short paper to-night upon certain small matters in connection with photography, which have come under my experience, and which I hope may be useful to some of you.

Every photographer who has used a tent must have experienced the same thing, namely, that the greatest trouble connected with this otherwise ingenious contrivance is in managing the water. There are two common courses—one is to have a small cistern of some kind fixed at the top of the tent; this is the most convenient when fixed, but, besides being somewhat inconvenient to fix, and being expensive, it keeps the photographer in a greater or less state of fear lest the whole thing fall on his devoted head; the other plan is simple in the extreme, and as inconvenient as it is simple: it consists in taking a bottle of water into the tent. I have tried by the device which I shall now show you to obviate the inconveniences of both plans.

Take an enema syringe, and connect a length of small india-rubber tubing to each end; the suction pipe should be about 3 feet long, the delivery pipe about 8 feet. The suction tube is then placed in a pail of water, which may be conveniently placed under the tent; the bulb of the syringe is laid on the ground, where it may be easily reached with the foot; the delivery pipe is led up to the top of the tent. There it may be connected with a piece of brass tubing fixed in a hole bored in a cork, which is then inserted into a larger hole bored in the top or side of the tent—this arrangement keeps the tube firm, and prevents any light getting into the tent. On the other end of the short brass tube is fixed a short piece of rubber tubing, which may or may not have a small rose attached to it, according to the taste of the photographer. In using the pump, the bulb of the syringe is pressed with the foot several times, which sends a stream of water through the delivery tube to the inside of the tent.

There have been several ingenious devices published for keeping ferrous oxalate solution from oxidising by contact with the air. One of the best of these is to pour the solution into a jar having a neck at the top like an ordinary bottle, and another opening at the side close to the bottom. In the lower opening is fixed a cork with a bent tube through it; the tube is bent at a right angle, so that when the end is turned up the solution in the jar cannot run out; a layer of paraffine oil is then poured on the top of the solution, so that no air at all can get at it. When the solution is wanted for use, the tube is turned down and the liquid run out.

I have another method, which, if it has nothing else to recommend it, is at least simple. I pour the solution into an india-rubber bag, such as is used for foot-balls. Put a clip of any kind on the india-rubber tube, connect a piece of glass tube about six inches long to the rubber tube, lay it on a shelf, and run out the solution as it is wanted. The glass tube makes it run quicker by the suction of the column of liquid. A bag of this size holds three pints, and they can be got two or three times as large, and, I daresay, for very large quantities, a gas bag would do, and they can be got holding about 50 gallons. While I am on the subject of ferrous oxalate, I may as well mention a very good method of restoring old developer, first used, I think, by Mr. Swan, of the firm of Mawson and Swan, by simply boiling it in a clean iron pan, or with iron wire or nails. The iron reduces the ferric oxalate in the solution to ferrous, with the production of oxide of iron, which may either be filtered off or allowed to settle.

It is sometimes necessary to reduce the density of negatives. There are several ways of doing this, but it is very doubtful whether a negative treated by any of them is permanent. I have a very simple method of reducing, which has the advantage of not affecting their permanency. After the negative has been thoroughly freed from hyposulphite, it is placed in a bath of very weak iodine solution and left for a time, depending on the amount of reduction required; the iodine forms iodide of silver with the metallic silver of the image. This is nearly white, and by the amount of it formed is shown the amount of reduction which will take place during the second process, which consists in dissolving off the iodide of silver by means of hyposulphite. Strong solution of iodide of potassium does as well or better for clearing off the iodide of silver, but it is much more expensive. The plate must then be well washed with water. For the iodine solution, it is most convenient to keep a strong solution in stock, and add a few drops of that to the quantity of water necessary to cover the plate. The solution should be of a straw yellow colour. This method of reducing needs to be used with care, as it is very easy by means of it to entirely destroy the image on a plate, by allowing the action of the iodine to go on too long, or by using too strong a solution. The hyposulphite must be thoroughly washed out, before applying the iodine, or they will form iodide and tetrathionate of sodium, the colour of the iodine being, of course, destroyed.

It has often been felt by myself, and doubtless also by other photographers, that a perfectly dead black paint, which would not rub off objects painted with it, and which could be mixed in a few minutes from cheap materials, would be a desideratum. After some experimenting, I have hit upon the following as the best:—Take about an ounce of starch paste of about the consistency used for mounting prints, rub into that a drachm or so of lamp-black—add a very little, only a few grains of rouge. This is best applied by rubbing it on the wood, or whatever else is to be blackened, with a piece of cotton wool. It washes off the beads perfectly easily, if not allowed to dry on. The rouge is added because the "colour of the black," if one may use such an expression of lampblack, seems rather doubtful, and the rouge makes it a reddish black; it dries rapidly. This black is particularly suitable for painting the inside of drying-boxes, cameras, &c., but it does not adhere well to metal.

We all know that our solutions of ferrous sulphate are apt to go bad. What takes place when this happens is, that oxygen is taken up from the surrounding air, forming ferric sulphate, which gives to old ferrous sulphate a dirty brown colour. The solution is not, however, necessarily spoiled because it is oxidised. It may be restored by the following method:—Boil the solution for a minute or so with iron filings, or for a longer time with lumps of iron; this reduces any ferric sulphate to ferrous, and produces oxide of iron, which is a very fine powder, and must be filtered off. The test of its perfect purity is, that it ought to give a pure white precipitate with potassium ferrocyanide of ferrous ferrocyanide; but if there is the slightest trace of any ferric salt present the precipitate will be tinged with blue; but this test is so delicate, that if the pure solution be allowed to stand for a few minutes in an open vessel, it will absorb oxygen enough to give it a slightly blue precipitate, and even if the ferrous sulphate be perfectly pure, the white precipitate at first produced will turn blue in a few minutes. This will take place almost instantaneously if the test-tube containing the precipitate be shaken up.

Until very recently it has been supposed that the effects of over-exposing a collodion negative were simply flatness, want of contrast, and fog. But lately I read in one of the scientific papers a remark which caused me much surprise, namely, that by very much over-exposing a collodion negative, you would get a positive instead of a negative. If the exposure was still more prolonged you would again get a negative, and so on for at least two or three changes. I have recently been trying to get a positive in this way, but without complete success. I have several plates which received various lengths of exposure. No. 1 got an ordinary exposure, which I shall call 1; No. 2 got about fifteen times as long as No. 1; it has too much contrast, as if it had been under-exposed. It came up in the developer very rapidly, the development being complete in about four or five seconds.

No. 3 got about 20 or 25 times as long as No. 1; it is almost the same as No. 2, but not quite so clear. No. 4 got about 40 times as long as No. 1; it is somewhat fogged. From

* Read before the Edinburgh Photographic Society.

this it is clear that the effects of very great over-exposure are not at all what we might have expected.

I must apologise for exhibiting to you negatives of such small size and having so many faults, but these were done in a hurry, and if I had had time I intended to have done others more fit to be shown to a society of skilful and critical photographers.

Since writing the above, I have read a very good paper, by Captain Abney, on this subject, in the *Philosophical Magazine* for September of this year, in which are explanations of the phenomena of which I have just been speaking.

During last session there was some discussion among the members of this Society as to the permanence of platinotype prints. I have been doing some experiments on this subject lately, and I am very glad to say that I have completely failed to destroy the image by any of the means which I have employed. Even a solution of chlorine, which certainly ought to dissolve the platinum, either does so exceedingly slowly, or not at all. In a word, the conclusion which I have come to is, that no agent will affect the platinum which will not also destroy the paper.

It must be more than a year now since the idea first struck me of trying to take a photograph by moonlight. I do not mean a photograph of the moon, but a view of a house or anything else by the light of the moon. But at that time gelatine plates were not made so sensitive as they are now, and on calculating the exposure which would be necessary, I found that it would be about twelve hours, which, of course, was not practicable; so for the time I gave up the idea; but since our plates have become so much more sensitive, I have tried several moonlight views, but have failed to get detail in the shadows, except with an exposure much longer than I would have expected from the ratio of light given by the moon to that given by the sun, which has been estimated by several observers at about 1 to 300,000. Accordingly I gave an exposure of about 3 or 400,000 times what I would have given in mid-day mid-summer sun, and get as the result—very little detail anywhere. I then did another, giving an exposure of about 800,000 times, and still there is not much detail in the lights, and none at all in the shadows. Here are two others. I do not remember the exposure which I gave to one of them, but the other got about 3,000,000 times as long as it would have taken at mid-day in summer. These two were done during the recent snow, which, no doubt, increased the light by the reflection from its surface, so that if there had not been snow these plates might have taken still longer.

Before sitting down, gentlemen, I would say a few words about what is commonly called the instantaneous shutter. In the first place, I consider the name a misnomer. What is instantaneous? The utmost we can do is to give a very short exposure. The great mistake which, it seems to me, most so-called instantaneous workers make is, that they do not appreciate that though this exposure is short, it is just as definite a space of time as a long exposure, and that a certain percentage of error will be as fatal in an instantaneous exposure as in a long one. For example, a plate which would be fully exposed in one-fortieth of a second and gets one-twentieth, will be exactly as much over-exposed as will be a plate which should get twenty seconds, and gets forty.

It has always been a marvel to me, that a man who is so sure of his exposure when it is long, that were he to deviate, by mistake, thirty per cent. from what he had judged to be the correct exposure, he would think he had made a grave error, will presently begin to blaze away with a shutter of which he knows nothing except that it is "absolutely instantaneous," about as definite as if he said he gave an exposure somewhere between a second and a minute.

We have want of some instrument far more scientifically exact than anything we have as yet—something which will enable us to give a short exposure, say to one-hundredth of a second, without much more percentage of error than a moderately careful man is likely to have with a long exposure. I believe the following to be the requirements for a thoroughly satisfactory instrument. Let us coin a word, and call it exposonometer.

1. It must be able to give a short exposure.
2. It must be able to give a variable exposure.
3. It must be able to give a definitely variable exposure; that is, it must be possible to set the instrument to give an exposure equal to any desired fraction of a second.
4. It must not be possible that it should shake the camera. believe no shutter can be certain of fulfilling this condition unles it has two equal moving parts, which move in opposite directions There is a law of nature which says, "action and re-action are equal, and in opposite directions;" and unless the camera be absolutely rigid, which is impossible, the camera must move to a certain extent in the opposite direction to the moving part of the shutter. True, this motion may be so small as to be imperceptible, but it must exist; and it seems to me it would be better to eliminate it entirely, by making the two re-actions of two moving parts counteract each other.
5. The aperture which passes in front of the lens must be several times as long in the direction of its motion as the diameter of the lens. If this be not the case, the length of exposure required to give a plate a certain amount of light will be much greater than need be; for example, suppose an attempt being made to photograph a body in rapid motion, and a shutter being used, having an aperture equal to the diameter of the lens, and supposing it be found that the shortest exposure which will do is one-thirtieth of a second; by using a shutter having an aperture of several times the diameter of the lens moving much more rapidly, the plate might be fully-exposed in one-fiftieth of a second. It is unnecessary to enlarge on the advantage of this. This will be readily understood, if you consider that with an aperture not longer than the diameter of the lens moving in front of it, there is no period of time during which the lens is not either being covered or uncovered; whereas, if the aperture be long, the uncovering and covering takes up a small part only of the exposure.

In conclusion, gentlemen, let me say that I would not have ventured to bring forward my little experiences in the form of a paper to be read before a body of men of so much experience in photography, but that I think every member of this Society should consider it his duty to give to the others the benefit of any of his experiences which he thinks may by chance be useful to them, however small they be. If this were more generally carried out, I think that this Society would be of even more use than it at present is.

Correspondence.

SILVER INTENSIFICATION FOR GELATINE PLATES.

Dear Sir,—I think the thanks of all photographers are due to Captain Abney for the practical method he has given for intensifying gelatine plates with silver; it has added considerably to the practical value of the gelatine process.

I have, during the last few days, intensified several negatives, and am very pleased with the results. A slight modification I have made will, I think, be of service to your readers. Before placing the plate, if it has been previously dried, in the alum bath, pour over a little alcohol, and allow it to remain a few seconds; this will make the solution in the after process take more kindly to the plate, and therefore enable one better to apply local intensification if necessary. Another suggestion I would make is to the effect that if the negative has been a long time exposed to the atmosphere, and become sulphurized, the application of a weak solution of cyanide will render it in a much better condition to receive the intensifying solution, and I find also it is an improvement to use the same on the negative after intensification; it dissolves any free silver remaining in the film, and also takes out some of the yellow colour, if any remains in the film.—I remain, dear sir, yours truly, W. England.

December 7th.

THE BAKERIAN LECTURE.

Sir,—I find that I have made a mistake in the initials of the name of the Dr. Vogel to whom I referred in my Bakerian Lecture, as your excellent correspondent, the true observer of the action of dyes on the sensitiveness of silver salts, points out. It will be business to notify the mistake, to which Dr. H. C. Vogel has also called my attention.—Yours faithfully, W. de W. Abney.

The Photographic News.

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REVERSAL OF THE IMAGE IN THE CASE OF GELATINE PLATES.

Geletino-bromide plates have a remarkable tendency to produce images in which the lights and shades are reversed—that is to say, a positive instead of a negative, or *vice-versa.* The conditions under which this reversal takes place are various, and are not at present well understood. In this article we do not intend to in any way recapitulate what has been written on the subject of reversed images, but rather purpose to jot down some few observations in order that other investigators may have an opportunity of carrying out experiments side by side with ourselves, the general goal being the elucidation of a subject which is at present but little studied. It is very well known—and has been known for many years—that an unduly long exposure will often lead to a reversal of the action of light, whether a wet plate or a dry plate is concerned.

It is not, however, so generally known that an extremely short exposure will often lead to the production of a reversed image on a gelatine emulsion plate; but, in order to favour the development of the reversed image rather than the normal one, two conditions must be fulfilled. The first of these is the absolute clearness of the plate as far as regards previous action of light, or any other agencies which might lead towarda a general reduction of the bromide of silver contained in the film. The second is the use of a developer containing an unusually large proportion of ammonia, together with a moderate quantity of pyro, and little or no alkaline bromide. Such a plate as that above specified, if exposed about the twentieth of that time which one might regard as a normal short exposure, will often yield a transparency instead of a negative, if development be carried on with a maximum of ammonia, but little pyro and no bromide. Such transparencies are often of a more or less composite or hermaphrodite nature, those parts which have received the maximum of lighting being opaque, those which have been acted on by a much smaller proportion of the luminous rays being clear and transparent; while the portions of the sensitive surface which have received the minimum of light present the same degree of opacity as those which have received the maximum of action.

The above observations naturally suggest the idea that in the case of ordinary gelatine plate work, we are, in reality, producing our negatives by the reversed action of light, and giving an exposure, perhaps, twenty—or more—times as long as would suffice to produce the first impression—this first impression being a positive picture. This surmise bears with it visions of glory and triumph to those who delight in securing pictures of express trains, bursting shells, and such like objects; but it has also a dark—aye, a very dark—side.

Such a condition of things would be equivalent to increasing the sensitiveness of the present plate, twenty, thirty—or, more likely, a hundred—times; and the question arises, how are such plates to be prepared and worked? Dark rooms would then have to be dark indeed, and it is difficult to imagine the possibilities of preparing emulsion and coating the plates in the obscurity which would then be necessary. Then, again, the shutters of our present dark slides, and the walls of our cameras, would be far too thin to exclude the minute trace of light calculated to impress plates intended for the production of what we may provisionally call *primary positives.* The shutter of an ordinary dark slide, usually made of mahogany, about $\frac{3}{16}$ of an inch thick, is quite inadequate to protect the usual gelatine plate against the full rays of the summer sun, as one may easily demonstrate by placing a negative and plate in a slide, and exposing to sunlight through the shutter.

We shall probably return to the subject of reversal next week, but just remark that in all ordinary cases of gelatine work, a positive image is developed simultaneously with the usual negative image; this positive image being distinctly visible at the back of the plate before fixation—and, indeed, after fixation, although it is not so obvious to an observer unaccustomed to look for it.

DRY COLLODION PLATES.

It is close upon twenty-four years ago since Dr. Hill Norris communicated a paper to the Photographic Society on dry collodion, in which he gave his method of preserving collodion plates with gelatine. In these days of rapid plates it may not be amiss to glance at the results which he obtained in those early days, since it will enable us better to appreciate what has been done now, and it also may teach us something which we can utilize. Dr. Norris, in preparing his plates by the bath process, took care to eliminate every trace of nitrate of silver, for he remarks that the free silver is liable to cause the plates to blacken all over. The following is the formula which he gave as a preservative :—

Gelatine (Nelson's patent)	...	128 grains
Distilled water	... ...	14 ounces
Absolute alcohol	... ...	2 ounces

He found, however, that it was necessary to vary the strength of the gelatine solution according to the nature of the collodion, occasionally using as high as ten grains and as low as four grains to the fluid ounce; but he remarked that the collodion which admitted of using the greatest proportion of gelatine gave the most sensitive plate. As in the culinary operations of jelly-making, he clarified his gelatine. To the sixteen ounces of solution he added a teaspoonful of albumen, and, after well shaking, he placed it in a water bath or by the side of a hot fire. At the boiling point of alcohol the albumen coagulated, and filtration then took place. By this operation the gelatine became "as brilliant as water," and certainly the films of his preparation which we remember seeing did not belie the truth of the assertion, since there was evidently no opacity left in the gelatine. The plates, after draining from the wash water, were immersed in the gelatine solution given above for some five to fifteen minutes, and were then placed on end before a fire or in a drying-box, care being taken that the drying took place at a temperature of about 10° above the gelatinizing point of the gelatine. He further says the plates "will keep a great length of time, as the surface of the iodide" (iodide alone was used in those days, be it remembered) is protected from atmospheric influences by a pellicle or varnish of gelatine." . . . "At the end of six weeks I have not observed any deterioration." Such was the outline of the preparation of Dr. Norris's plates which were so well known twenty years ago. It will be in the recollection of our readers that in one of our recent issues we drew attention to the possibility of making collodion emulsion as sensitive as gelatine emulsion; and we pointed out some ex-

periments which we had undertaken with gelatine. Since then we have further experimented with the above formula, and with greater success than heretofore. By using high temperature pyroxyline in small quantities in proportion to the solvents, and by using bromide of cadmium, we have got films which are decidedly more porous than when zinc or alkaline bromides have been used, the old feature in cadmium salts coming to the fore in a very remarkable manner. These gave a film which was powdery and absorbent of the preservative—in fact, gave such qualities to the pyroxyline as it is usually found old collodion does. The above preservative seems to answer very fairly, but we think that a slight modification may render it still more useful, and we have great hopes that before long a collodion emulsion may be prepared which shall come very close to the sensitiveness of gelatine plates. That collodion emulsion is, in reality, as sensitive even now, we have no doubt, the only difficulty in the way to employing it being the want of a developer which shall not cause a general reduction. This is, in a great measure, effected by the use of the gelatine, and we hope shortly to be able to give further details which at any rate will advance the solution of the problem we have set ourselves.

In the last Topic of the Day we had a valuable mode of intensifying gelatine negatives given us; the necessity of a collodion emulsion will be naturally lessened if it succeeds in the hands of others as well as it does in those of Mr. Carroll and Captain Abney. At the same time, the possibility of keeping a supply of emulsion with which to coat a few plates will always be a boon to those who have not leisure to wade through the whole gelatine process, or who do not care to—or perhaps cannot afford to—purchase their plates ready made. Some plates made with collodion emulsion which were gelatinized some months since are as sensitive to-day as they were when freshly prepared.

Notes.

Mr. William England has shown us a series of pictures taken this year in Switzerland on gelatine plates. The most charming effects of light and shade have been secured; summer clouds float over black pine forest and deep shadowed vale, the gloom rendered with full detail, while the high lights are milk-white in tone, with all absence of glare. In nearly every plate, Mr. England has succeeded by the aid of his well-known camera screen, or camera-peak, in faithfully depicting the sky as well as the earth; some of his "cloud-capt" peaks are really marvellous.

Mr. England employs slow pyrogallic development, the details of which our readers will see in the YEAR-BOOK; he always makes it a rule to coat the negative with collodion before varnishing. The gelatine film then resists damp so much better.

A gentleman in San Francisco suggests a plan whereby photography could be advantageously employed to check frauds at elections. The method, according to the *Scientific American*, is to have photographic portraits of each voter with particulars regarding him at the back of the mount. On presenting himself to vote, the portrait will be dropped into the ballot-box, together with the balloting-paper. The disposition on the part of electors to "vote early and vote often," might thus be restrained.

Last week we called attention to a Home Office regulation on the subject of photographing a prisoner's hands. The hands are ordered to be placed on the prisoner's breast, so that the backs are shown. Mr. Woodbury points out that it would be better to show the front of the hand, for the reason that the markings on the palm might be seen.

Mr. Woodbury called attention to the utility of "palm" photographs as a means of identification many years ago. We read in an old number of the *London Medical Record* that Mr. Woodbury recommends for purposes of identification, of criminals, for example, that it is only necessary to get a distinct photograph of the palm of one hand, taken in a strong oblique light, so as to bring out the markings strongly. This will be found a map, he says, never alike in two persons; no disguise short of actual disfigurement can do away with the difference.

Have a lock and key to your album if you value its contents. It is not your own fingers, but other people's, that mark the book.

Two men of mark, a chemist and physicist, died last month. The first an Englishman, Sir Benjamin Brodie, F.R.S., was Professor of Chemistry at Oxford for many years; the last, Professor Charles D'Almeida, occupied the Physical Chair at the Lyceum of Henri IV. in Paris. Professor D'Almeida was first to suggest the preparation of micro-photographic despatches during the siege of Paris, by means of which, as we know, communication from the outside world reached the beleagured capital.

No less than 100,000 of these micro-photographic despatches were carried into the beleagured capital by pigeons during the siege. M. D'Almeida was efficiently seconded in the work by M. Dagron, to whom the preparation of the tiny films was entrusted, and it was due almost entirely to these two gentlemen that "la poste ærienne" became practical.

What are photographic experimentalists about? Another important application of Mungo Ponton's discovery has recently been made, but not by a photographer. The valuable properties of a mixture of gelatine and bichromate of potash have long been known, and suggestions without number made for its use, from pigment printing to sausage skins for the famous pea-sausage. But it has been left to Dr. Heinzeilung to propose the preparation of leather by simply treating hides with bichromate.

There is no tanning action, properly so-called, here involved; but skin treated with bichromate and exposed to the action of light is converted into a sort of mineral leather, which we are told is a very good substitute for the true article. At any rate, there are already no less than nine "chrome tanneries" at this moment in Germany, and in Frankfort alone as many as fifty shoemakers employ the new leather. Dr. Heinzelung's patent is therefore a valuable one.

Mr. Blanchard's advice to allow the gelatine negative to remain in the alum bath until the film becomes horny should be adopted by all. A horny negative may be ill-treated with impunity; you may rub off an old coating of varnish, and apply another, without the least compunction

Mr. W. C. Crofts has hit upon something exceedingly good in a small way. He writes to tell us that he makes developing trays for dry-plate work by turning up the edges of ferrotype plates. What could one have lighter and more convenient for travelling? Then, again, there is no adhesion between the flexible bottom and the plate, a slight twist on the tray serving to bring one corner of the plate within easy range of the fingers.

A nest of half-a-dozen such trays, made so as to just fit in each other, would form a valuable aid to the wandering amateur's kit, and the weight is practically nothing. Some might serve as dishes, and others as covers.

Now that Mr. Crofts has given us a hint that such things as ferrotype plates can be used for other purposes than making tintypes and telephones, why should we not have plate-boxes—and even pocket cameras—made of them? Let us hope that Mr. Crofts will not stop at dishes. Little matters are often of more real interest and importance than big things.

Topics of the Day.

LIONS AND TIGERS BEFORE THE CAMERA.

BY THOMAS J. DIXON.

Studies of animals always had an attraction for me. Domestic pets were often brought to my father's studio, and the care and patience he exercised in photographing them caused many sitters of this nature to visit him from far and near. The results of some of his work in this direction have been in various exhibitions of the Photographic Society. For myself, naturally fond of animals, I used to feel a pleasure in helping him in this particular class of work, and as Albany Street is not far from the Zoological Gardens, and I frequently visited them, it not unnaturally came into my mind to make studies of some of the animals there.

Having obtained the required permission of the authorities—it was four seasons ago—I resolved that my first essay should be in front of the lions' cages. I took with me a half-plate camera, a portrait lens, a dark tent, and all other necessaries for working wet plates. My lions, at first sight of the camera, exhibited a good deal of shyness, and turned to make off; but presently they seemed curious to know what the instrument was, and tried to reach it with their paws. It was evidently necessary, as a preliminary, that they should be familiarised with the sight of the apparatus, so I arranged with a friendly keeper to place the camera with the dark cloth over it, in position, daily, in front of the bars just out of their reach.

A few days were allowed to pass, and then I paid my new friends another visit; I found them quite reconciled to the presence of the curious object. Camera and I could now move hither and thither without in any way disturbing their susceptibilities; but the next operation demanded still further patience, namely, to expose at the right moment. I had to be incessantly on the watch. I made trial after trial, but several mornings' work was lost before I secured a negative worth looking at. Time after time I might have one of my lions focussed "as still as a mouse," when, on changing the screen for the dark slide, he would turn up his nose, as if he smelt powder—my collodion—and slowly and deliberately shift his position. He would never quietly resume it; no, he had to be focussed afresh, and so round and round the cage was I led a patient (?) dance. He was not frightened, but he evidently thought it as well not to be over-confident. But perseverance met with its reward; for one day, the weather being very hot, just as I was fairly tired out, through my subject's movings and dodgings, on my last plate I secured an excellent negative—a lioness. With this I closed my Zoo campaign of 1877.

In 1878 I was too much occupied with other work to go to the Gardens; but in the autumn I found time to enlarge some of the best of the negatives for the Photographic Exhibition, where they attracted so much notice that I was encouraged to try for something better the following season. Gelatine dry plates had then come into general use, and they bade fair to meet the requirements of zoological work. No plates spoiled through waiting, quicker exposures, no smell for the sensitive noses of the animals—all these advantages promised easier work and more certain results. Still further to assist in the fresh campaign, it was resolved that I should have a special camera. This was made upright, double-barrelled, one lens above the other—the top one to focus, the bottom one with a spring shutter, to take the negative, so that a plate could always be ready. Moreover, I provided double slides enough to hold plates for a good day's work.

The question has often been put to me, "How do you get the animals without the bars in front? Do you go inside the cage?" I have said, "Not quite. There might, in that case, be some little disagreement about position and pose, and, in settling the matter, I might come off second best." No, I put the lens between the bars; that was the reason for the camera being made upright. I could not visit the Gardens in 1879 until the season was rather advanced, and then I devoted my energies to trying for a lion and lioness in company, which I had not attempted before. The first days were given to familiarising them with the presence of the camera. In this I succeeded so well, that they not only showed no annoyance, but became, as I thought, for lions, quite urbane. In spite, however, of special camera, rapid dry plates, and urbanity of subjects, so many were the difficulties resulting from movements of animal and movements of clouds, &c., that days passed without my getting a satisfactory negative. Nevertheless, I held on patiently, watching for opportunities, until one day, and, as it turned out, that day only, it was my good fortune to secure no less than twelve good sharp negatives. It was six of these, enlarged, which were in the Exhibition at Pall Mall, and were distinguished with "medal." Copies of these have probably been seen by most of the readers of the Photographic News, for they have been scattered broadcast over the country.

My last success led me to turn my attention to the tigers, hoping to get some to accompany the lions to Pall Mall; and so I passed the whole of one day about a cage containing three of these handsome creatures. But so lively were they, and such a fancy did they take to the camera, that I had reluctantly to abandon that idea. So I said farewell to them, hoping to be able to open my next campaign with them.

In the spring of 1880 I recommenced operations with the tigers, and found them quieter now than in the preceding summer. By patiently watching I got on fairly with them, securing now and then a good sharp negative; but I found I could not get on so well as on that remarkable day with the lions, a day that was, indeed, for opportunities, one in a thousand. Tigers are more restless than lions; with them I found it necessary to have an assistant to keep watch, for, when focussing, one or the other would creep quietly along, and make a dab at camera and operator. They are as playful as cats. On one occasion my assistant was not

quick enough in giving me notice, and I had a close shave in getting clear of the bars with my camera to avoid the down blow from a playful paw, which would have suddenly stopped my photographing at the Zoo. The quick glance of the owner of the paw soon afterwards fell upon a dark slide I had laid upon the ledge of the cage, and his paw was quickly on it. Fortunately I, too, had already got a grip of it, and then I was enabled to slide it from beneath his paw, and remained "master of the situation."

In the gardens, as many of my readers may have seen, is a nice fat, white donkey which draws the mowing machine over the lawns. One of the keepers assured me that "them tigers' anker arter that donkey," and it was probably owing to this "'ankering" on the part of the animal that I in the end obtained my best view of a tiger. Whilst in a good standing position, apparently studying the donkey, I was enabled to secure the only really good picture of a tiger on all fours. I am sure the fat donkey's co-operation availed here, and I fervently hope the shadow of that donkey may never be less.

This piece of good fortune made me desirous of having a picture of a lion standing, so I returned to them, and waited and watched, and watched and waited, trying day after day, but I discovered nothing but the certainty that what they wanted, was to be let alone and sleep. As, however, *my* want was that they should stand, I at last so far interested the keeper in my operations as to induce him to stir them up. This he did, not with a pole or bar, but with the magic of vocal sounds. These animals do not like to be spoken to roughly, but at a gentle word from those whom they know they would rise to their feet and stand still a few seconds, seeming to ponder as to what was to be done next before lying down again in a fresh place. Having been roused thus, I took as many shots at them as I could. If the one I wanted moved away to lie down again, I followed him up and got him focussed in time for my friendly keeper's magical stirrer. In this way I got about a dozen exposures. On one plate I was so fortunate as to get a lion and lioness; but, alas! on developing, they all turned out useless from undue exposure—*the wind was in the East*.

I felt this failure much, for it was the last day I could spare at the Zoo for that season. But, after all, I had not much reason for dissatisfaction.

Next year I propose to resume operations; but I shall be careful not to begin as I finished my last campaign, *with the wind in the East*.

The "Topic" for next week will be "A Panoramic Lantern," by J. Thomson, F.R.G.S.

PHOTOGRAPHY IN CONNECTION WITH BALLOONING

BY W. COBB.*

At the request of our esteemed President, I appear before you this evening with a short paper having reference to my recent balloon trip, and I must candidly confess that I feel the elevation of three or four feet on this platform much more acutely than I did that of five or six thousand in the balloon just referred to—indeed, I feel myself placed in a very awkward, if not ludicrous, position. In the first place, I must of necessity reiterate what I have stated elsewhere, that photographically my adventure was comparatively, though I will not say absolutely, a failure; and yet, in the next place, I apprehend I am expected to offer some remarks of an instructive character for the special guidance of those who may follow in my wake, and who may wish naturally to provide themselves against any possible cause of failure which might be incidental to a similar undertaking. This latter, however, is certainly not in my contract, and I fully intend to reserve all extras for a future occasion.

You, gentlemen, who are practical photographers, will readily comprehend the difficulties of the situation if you will only take into consideration the attending circumstances, viz., past three o'clock on a dull hazy afternoon at the Christmas end of October, and not knowing until the very last moment had arrived whether I could ascend or not; and then self, apparatus and all, bundled holus-bolus into the car just as it was leaving the earth. It is, I was going to say, a remarkable fact, but I suppose it is in full accord with the inexorable law of the eternal fitness of all things, that a sudden transition from a lower to a higher sphere of action, or an abrupt rushing from one extreme to the other in this mundane state of existence, is never productive of the most happy results, and although there may sometimes be exceptions to this rule, I am fully persuaded that if these could be traced from their source to their final limits, they would prove more conclusively than even the ordinary run of such events, the truth of the proposition.

The beautiful and multifarious operations of nature are to my mind convincing proofs of the correctness of this theory. The grain of seed placed in the ground undergoes a gradual and great variety of changes prior to reaching its final stage. Its swelling, and its bursting, then the putting forth its tiny leaves above the surface of the ground—all these are so gradual as to be entirely imperceptible in their action. If we turn to climatic influences the same truth manifests itself, although, perhaps, in a less striking degree. Who can tell how insignificant was the original force of the terrific cyclone—spreading devastation and fury—increasing in fury as it increases in velocity? "But what on earth has all this to do with your subject?" I fancy I hear some one exclaim. Simply this, I reply, that such a sudden rush from terra firma to regions ethereal as I experienced in my late balloon trip, and that under such peculiarly adverse circumstances, could hardly be expected to result in a complete success, such being, as I have attempted to prove, contrary to the general order of things. Moreover, I have brought myself to the belief that, after all, my failure has a most fortunate circumstance. You will please bear in mind that I use the word failure here in its most modified sense, and I would remark that Mr. A. L. Henderson, for whom I acted as representative on this particular occasion, in his determined adherence to that which he considers right, and for which he has become almost proverbial, steadily refuses to let the results be seen, believing that such a course would be detrimental to the objects in view, as well as an injustice to the Balloon Society, where he also refuses to show them.

I, for one, regard the school of failure as a grand old institution. Any object failed in, ought at least to be worth succeeding with, and a mind rightly constituted regards failure as a stepping stone to success. The experimentalist values but little that which he arrives at without repeated failures; but, on the other hand, that which he has achieved by dint of careful experiment, determination, and well-studied failures are prized accordingly, and I think I speak within the bounds of truth when I say that the grandest discoveries or inventions of this or any other period of time are the results of the most profound thought, the proper estimation of the smallest minutiæ connected with the subject, and the sometimes almost overwhelming failures which have been experienced, grappled with, and ultimately overcome. Of this, many examples might be cited, did time permit.

I am inclined to think that the future historian of our country will regard and chronicle the present era as an eminently scientific one, in which photography must, of necessity, occupy a prominent position, and there appears to be every reason to believe that the name of one of our fraternity will be handed down to posterity as one of the leading scientists of the age we live in. You will, of course, have anticipated me when I mention the name of Mr. Joseph Swan, of Newcastle, whose researches in the science of electricity are just now commanding the attention of the whole scientific world.

The beseeching eyes of the photographic brotherhood are specially directed towards him at the present time. For many years past he has been a guiding star in the profession, and now, as the dearth and darkness of winter are looming upon us, we look towards him as the rising sun of our prosperity.

Ballooning, which has until very recently seemed to have no definite object in view beyond that of being suspended in mid-air for an hour or two, appears now to be in a fair way of taking its place in the list of useful arts and sciences, and I can well imagine that the subject having been taken in hand by men who are not easily daunted by failure—such as military and civil engineers, and others who have received the advantages of a scientific training—it is more than ever likely to be brought to a thoroughly practical issue; and, in connection with this, may we not hope photography, which has already rendered such valuable aid in almost every other department of science, will some day take a prominent part? As an auxiliary in meteorological surveys

* Read before the South London Photographic Society.

there can be no reason why it should not signally distinguish itself. The very great and important strides which it has recently made, especially as regards its wonderful sensitiveness and consequent rapidity of action, make the camera and lens a most desirable and valuable adjunct to the equipment of the man of science, whatever branch he may be engaged in, and will doubtless in course of time be appealed to for the purpose of either confirming the correctness or proving the fallacy of any data which he may have arrived at. I suppose by this time you will have seen why I regard my failure in the balloon enterprise as a fortunate circumstance. Had the attempt been—say—moderately successful, it would probably have satisfied idle curiosity, secured its condemnation by faint praise, and little more been thought about it. As it is, however, I have the promise of another ascent when a favourable opportunity arrives for securing successful photographs. Perhaps this explanation may appear to be a somewhat selfish one, but I think you will agree with me that it is a pardonable kind of selfishness, and just by way of keeping myself on the best terms with you all, I will promise that should the affair come off—as indeed, I hope it may—I will strain every nerve to make it a success, and give you all the details in a paper which I will endeavour to make far more interesting than I can dare to hope this one can be.

I will now close my paper with a suggestion, which is this—why should not the South London Photographic Society possess a balloon of its own? I would be the last one to suggest a scheme of this kind merely for pleasure or amusement, but I believe there is a great future for photography in this direction, and regarding the question in its £. s. d. aspect, surely if one person of moderate means can afford to keep his yacht, which must perforce be a continuous expense, there should be no reason why a Society like this, with men of position and wealth amongst us, should not possess the means within itself for carrying on that research in matters connected with science which we its members profess to delight in. Let us try the experiment, and so identify ourselves with others who have already found—

Hid in the deep recesses of the earth
Huge treasures of inestimable worth;
Still new domains for deep research appear
Where men of science find a fitting sphere.
By their own light they work with vigour on:
Some to the herald's blast, some noiseless as a "Swan"
Or wafted by the flap of nature's wings;
Some seek the charm of most celestial things.
Science and art supply the magic keys
To caskets of rare jewels and deep mysteries.
Then let us all unite the power of will
To the great forces, energy and skill;
And then our concentrated powers shall find
Something to teach and elevate mankind.
Then claim the prize which shall anon be given,
A mark on history's page, with the approving smiles of Heaven.

Proceedings of Societies.

South London Photographic Society.

The 21st annual meeting of this Society took place on Thursday, Dec. 2nd, in the Rooms of the Society of Arts, Adelphi, the Rev. F. F. Statham, M.A., president, in the chair.

The minutes of the two preceding meetings having been read and confirmed, the following gentlemen were duly elected members, viz., Messrs. H. B. Jones, D. Branford, T. Allen, W. K. Burton, and Capt. H. Kerr. The election of officers for the year 1881 then took place, the following being elected:—

President—Rev. F. F. Statham, M.A.

Vice-Presidents—Jabez Hughes, Frank Howard, W. Brooks, P. Mawdsley, and E. Cocking.

Committee—Messrs. T. Bolas, F.C.S., W. B. Bolton, A. Cowan, E. Dunmore, L. Warnerke, F. York, E. W. Foxlee, G. F. Williams.

Hon. Treasurer—F. A. Bridge.

Secretary—H. Garrett Cocking, High Road, Lee.

Mr. W. A. Bridge, in the course of a few remarks, said he had been lately going through the visitors' book, and he had found the same names on that book for some years past as attending the meetings as many as six times a year. Now he wished to call the attention of members to this fact, and also the attention of those visitors. The Society was always glad to see visitors, but he thought it scarcely fair that persons should continually attend and derive benefit from the meetings without in any way contributing towards the expenses of the Society.

The Chairman then put to the meeting an addition to the rules, laid before the members at the last meeting, to the following effect:—"That ladies be admitted members of the Society on an annual subscription of 5s."

Mr. E. W. Foxlee then put the following as an addition to the above:—"That country members residing at a distance exceeding thirty miles from London be also admitted at 5s. per annum."

Both of these resolutions were put to the meeting and carried.

The Secretary then read the Annual Report as follows:—

"The Committee have much pleasure in presenting the 21st Annual Report of the South London Photographic Society. The past year has not been one of any startling occurrence in connection with the Society, but the Committee may point to one or two things of interest. In the first place, the number of members on the books of the Society have considerably increased, which must of necessity bring new blood into the Society, and therefore help to increase the interest of the meetings.

"Mr. E. Dunmore's suggestion of a monthly artistic competition is being carried out, and your committee trust that the results shown by the conclusion of the year's competition may be such as to justify the Society in establishing a similar competition in succeeding years. The committee are pleased to record the fact that the attendance at each meeting has been more numerous than of late years, and an increased interest taken in the proceedings.

"The following papers have been read during the past year:—'Photographic Surprises,' Rev. F. F. Statham; 'Photography and Colour for Educational and Technical Purposes,' Mr. J. T. Pearsall, F.C.S.; 'What is an Artistic Photograph,' Mr. E. Dunmore; 'An Improved Alkaline Developer for Gelatine Plates,' Mr. B. J. Edwards; 'The Ferrous Oxalate Developer, Mr. F. York; 'The Pyramidal Form of Composition in Pictoria Work,' Mr. E. Cocking; 'Gelatine or Collodion—Which Pays Best?' Mr. J. S. Hazard; 'Remarks on Gelatine Plates when Used for Landscape Work,' Mr. E. Dunmore; 'The Optical Lantern,' Mr. C. G. Cutchey; 'How to Remedy a Defect in Gelatine Films,' Mr. E. Dunmore; 'Ballooning from a Photographic Point of View,' Mr. W. Cobb.

"Apparatus, appliances, &c., have been shown by the following gentlemen:—Messrs. F. York, B. J. Edwards, F. Howard, Payne Jennings, Wratten and Wainwright, W. Brooks, E. Dunmore, A. Cowan, T. B. Blow, E. W. Foxlee, A. L. Henderson, J. C. Eames, J. Werge, G. Donkin, W. T. Wilkinson, Archer Clarke, W. J. Chivers, W. B. Bolton, J. A. Harrison, and W. C Hughes.

"Your committee, finding that this present year was the 21st of the existence of the Society, and also of the presidency of the Rev. F. F. Statham, determined to celebrate the same by a complimentary dinner to the President. This took place on the evening of July 24th, when a large number of members and friends assembled under the chairmanship of Mr. Jabez Hughes.

"As the future prosperity of the Society must depend upon the matters brought forward for discussion, it is hoped that in the forthcoming year each member will bring forward anything which may interest the members at large."

The Hon. Treasurer then read the financial report, the details of which would not interest our readers; but we may say that, after meeting all expenses, the Society has a balance in hand of £11 0s. 1d.

A vote of thanks to the officers for their services during the past year having been given, the business part of the proceedings terminated, and the Chairman called upon Mr. Cobb to read his paper on "Ballooning from a Photographic Point of View" (page 597).

The Chairman, in the course of a few remarks said, that photography no doubt would lend valuable aid in the study of astronomy. He thought the failures ought to be shown; as they showed where improvements could be made that would lead to great success, the source of failures ought to be also chronicled. What was desirable ought to be considered not so much as regards photography, but from a meteorological point of view. He could easily understand the many difficulties in photographing from a balloon, the spiral motion of the car being the principal difficulty, and the best efforts of the Balloon Society should be given to try and counteract such motion. He would ask if any views of the earth could be taken from a balloon by means of mirrors so as to avoid the disadvantage of pointing the camera over the side of the car. If the camera was placed directly in the middle of the car the gyrations of the balloon would not be so noticable.

Mr. A. L. Henderson said the reason that photographs were not shown was his fault. He had seen some very bad photographs taken from M. Fonville's balloon, and he was determined not to show anything till he had something better, as he was sure better things could be obtained. He (Mr. Henderson) was to have gone himself, only at the last moment Mr. Wright had said the gas had not sufficient lifting power, so Mr. Cobb, as he might say, was bundled in, apparatus and all, without any previous preparation. He considered the cleverest thing Mr. Cobb had done was to take a balloon from a balloon, and obtain a good negative.

Mr. W. Brooks thought that perhaps if the camera was moved during exposure in the opposite direction the gyrations of the car would not be noticed so much.

Mr. Henderson said that Mr. Simmons had constructed a parakite with which he and Mr. Simmons were going to make some experiments as soon as weather would permit, the value of which would be that the parakite could be sent up to almost any height with the camera; the exposure would then be made by clockwork after having been in the air a certain time. In war this method would be of great value, as views might be taken from one side of a mountain showing what was on the other.

Mr. Bolas thought the gyration of the car might be stopped by means of sails set round the car.

Mr. Wilmer thought if the camera were suspended from the middle of the balloon by means of fine cord, the motion would not be much felt.

Mr. Chivers said if the floor of the car always remained in a horizontal position, he should think by means of a magnet placed on the camera, the camera would always point to the north, and thus failures from the gyrations of the car be avoided.

Mr. Hendersnn said this was a most valuable suggestion, and, he should think, might answer well.

After a few remarks from the Chairman, and a vote of thanks to Mr. Cobb, the discussion dropped.

The Chairman having announced that the next meeting would be the popular lantern night,

Mr. C. G. Cutchey kindly promised to bring his lantern, and said that if members would send up their slides in the order they wished them shown, it would facilitate matters.

Mr. Brooks said from previous experiences, it would be well for the slides all to be 3¼ inches high.

Mr. Bridge said if members would send a line to the Secretary, stating how many slides they would contribute, some sort of programme could be arrived at.

Mr. E. Cocking then proposed, and Mr. E. W. Foxlee seconded, a vote of thanks to be conveyed to the Society of Arts, for their kindness in lending the use of their rooms for the meetings of the Society, which was carried.

Edinburgh Photographic Society.

The second ordinary meeting of this Society was held at 5, St. Andrew Square, on the evening of Wednesday, the 1st instant, Mr. Lessels, president, in the chair. There was a large attendance.

The minutes of the last meeting having been approved, the following gentlemen were unanimously elected ordinary members:—Messrs. Alex. Murray, Alfred E. Moffat, Thos. Swanston, James Meek, James Sutherland, and Councillor Gibson (Edinburgh).

Mr. C. J. Burton then read a paper, entitled "Notes and Experiences in Photography" (see page 592.)

At its conclusion, Mr. Neilson said he had never before listened to a paper which contained so much information conveyed in so small a space and so short a time. He hoped that some more of the young members would come forward, like Mr. Burton.

Mr. Mathison showed two instantaneous views, taken with a drop shutter: one of a steamer while going at the rate of fifteen miles an hour, and the other a yacht, taken from the deck of a steamer, both vessels being in motion: both pictures were perfectly sharp. He thought Mr. Burton had made too much of a bug-bear of the instantaneous shutter, as there was really no difficulty in using it, as, once set, it always gave the same length of exposure, and one could easily regulate the difference in the subjects by the development.

Mr. Craig-Christie warned photographers against the use of india-rubber bags, as they were very injurious to chemicals in most cases.

Dr. Hunter thought that anything in the shape of a tube to convey water, while working in a tent, was a mistake, as it invariably led to mishaps, and quoted various experiences while photographing in India.

Mr. Turnbull made several remarks on the various subjects which Mr. Burton had brought before the Society.

Mr. Dobbie highly complimented Mr. Burton on the very creditable paper which he had read, and on the kind manner in which he had come forward and volunteered to do so, and he begged to move a very hearty vote of thanks to him.

Mr. Rankin then asked the following question: "How can stains caused by printing from unvarnished gelatine negatives be removed?"

Mr. Tamkin said they could be removed by steeping the negative in a weak solution of bichloride of mercury.

Mr. Jamieson read a report on some experiments which he had been making with a gelatine plate, by cutting the negative in three, after exposing and developing the different parts with a different temperature of water.

Mr. Mathieson moved that the Council should have full powers to make arrangements for this year's presentation print, which was unanimously carried.

A vote of thanks to the Chairman terminated the meeting.

Photographers' Benevolent Association.

This Association held its usual monthly meeting at 181, Aldersgate Street, on December 1st.

The minutes of the previous meeting having been read and confirmed, Mr. J. T. Hackett was proposed and elected as an ordinary member of the Association

The Secretary stated that among the receipts for the past month was a donation from Messrs. Window and Grove of £5 5s.

Grants for several purposes having been issued, the meeting adjourned till January 5th, 1881.

Dundee and East of Scotland Photographic Association

Proposed Exhibition in Dundee.

An important and well-attended meeting of this Society was held in Lamb's Hotel, on Thursday evening last, Mr. J. C. Cox in the chair.

Members present:—J. C. Cox, *President*; Messrs. Valentine and Robinson, *Vice-Presidents*; Mr. W. G. Tannahill, *Hon. Treasurer*; C. Johnson, *Hon. Secretary*; G. T. Roger, H. T. Frazer, *Council*. Messrs. Watts, Mc'Nab, Geddes, and numerous members—several from Glasgow, Perth, Arbroath, &c.

The Secretary read the minutes of the last general and two council meetings, which were approved and confirmed.

The Secretary read a letter from Lord Strathmore, which was entered in the minutes as follows;—

"Glamis Castle, November 8, 1880.

"Dear Sir,—I have to thank you for your letter of 5th inst. Allow me, through you, to thank the members of the Dundee and East of Scotland Photographic Association for the honour they have done me in inviting me to be patron of the Association, and to assure them that I accept the invitation with great pleasure.—I am, dear sir, yours faithfully,

"Chas. Johnson, Esq., Secretary." "Strathmore."

After the minutes of the last meeting had been read and confirmed, the President informed the meeting that numerous replies to his letter with regard to holding a Photographic Exhibition in Dundee next year had been received from all parts of the United Kingdom, both from departments of the Royal service, distinguished amateurs and professionals, mercantile houses, &c. The letters were all of so cordial and encouraging a nature as to justify the undertaking. The President therefore proposed, and Mr. W. D. Valentine seconded, that a Photographic Exhibition be held in 1881. The motion was carried with acclamation.

Resolved that it be entitled "Dundee and East of Scotland Photographic Association Society's Exhibition, open to Great Britian and Ireland."

Resolved that the Secretary make formal application to the Board of Directors of Albert Institute for the use of Hall, &c., for exhibition in Oct., Dec., 1881.

Proposed by Mr. Jeddes, seconded by Mr. Robertson, and carried, that a Guarantee Fund be raised by call upon each member.

Mr. Roger intimated that Mr. M. Jackson, Perth, would read a paper at the next meeting.

Six gentlemen were duly proposed and seconded as new members.

A vote of thanks to the President for his energy in promoting the Exhibition was passed, and the meeting closed.

French Photographic Society.

This Society held a general meeting on 5th ult., M. Peligot presiding.

M. Bordet fulfilled the duties of secretary.

The mayor of Tours sent to announce that an artistic, industrial, commercial, and horticultural exhibition would take place in that town during the month of May, 1881. Anyone desiring the necessary information might obtain full particulars on application, as soon as the committee of organization had finished the work.

M. Rossignol wrote that he had used ferrous oxalate developer for collodion emulsion plates with great success.

Several works had been received by the Society, viz., a pamphlet on the reversion of the photographic image, by Capt. Abney; a memoir on a method of direct auto-collimation of astronomical objectives, by M. Ad. Martin; a pamphlet on the gelatino-bromide process, by M. Bascher; and a treatise of photography in German, by Dr. Liesegang, for which the authors were thanked.

M. Davanne announced that the Council had nominated M. Bordet as secretary to assist in the editing.

Dr. Wolfram has patented the following method of preparaing collodion emulsion. He dissolves two grammes of guncotton in 150 cubic centimetres of mixture of alcohol and ether in equal parts; to the half of this collodion is added a solution of 4 to 16 grammes of nitrate of silver dissolved in 25 to 80 cubic centimetres of concentrated ammonia diluted with an equal volume of alcohol. To the other half is added the equivalent amount of bromide of sodium, or ammonium previously dissolved in from 10 to 20 cubic centimetres of water. The two collodions are mixed, and the emulsion is precipitated by water; two per cent. of glycerine and a sensitizing substance are then added. This emulsion is more rapid than the ordinary, but is not equal in rapidity to gelatine emulsion.

M. G. Bouillaud gives a method of causing the retouching pencil to act on gelatine. After the last washing the plate is immersed in a 20 per cent. solution of borax for five or six minutes; then it is allowed to drain and dry. Retouching is then much more easily performed than on gum.

Attention was drawn to Mr. Baden Pritchard's method for reproducing faded prints by collodio-chloride of silver.

Dr. Eder, in studying the action of light on the salts of iron, finds that the greatest reducing action occurs with a mixture of perchloride of iron and oxalic acid. Representing the quantity of protoxide of iron formed by 100 in this reaction, the relative amounts of reduction by identical exposures will be expressed by the following numbers :—

Oxalate of peroxide of iron	89
Oxalate of peroxide of iron and ammonia	80
Oxalate of peroxide of iron and potash	78
Tartrate of peroxide of iron	80
Tartrate of peroxide of iron and ammonia... ..	80
Citrate of peroxide of iron and ammonia	15
Perchloride of iron and citric acid	19
Perchloride of iron and tartaric acid	25

M. Vidal exhibited for M. Janard, of Lyons, a piece of silk with black photographic designs. The process consists in sensitizing the material in a bath, printing successively under various negatives and developing at once; the ground of the material remains perfectly clear. The process may be carried on at the cost of about two-pence the square yard. A piece of artist's canvas was also shown printed in the same manner.

M. Davanne formally presented the Society with the diploma to be delivered to each member, according to the decision of the administrative council. Several members having exhibited apparatus, &c., the proceedings terminated.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday next, December 14th, at the Gallery, 5, Pall Mall East (the Winter Exhibition of the Water Colour Society being on view), when the award of the Paget Prize will be made. A discussion upon the Gelatine Process will take place, and a paper "On a Simple and Expeditious Method of Preparing Pyrogallol for Dry Plate Development," will be read by Professor T. E. Thorpe, F.R.S., Yorkshire College of Science. Also, papers "On the Use of Iodide and Ammonia in Gelatine Emulsions," and "On a Sunshine Recorder," will be read by Captain Abney, R.E., F.R.S.

To Correspondents.

Collodion *versus* Gelatine.—Mr. A. P. Chambers, referring to the article in "In and Out" last week, says that if the wet plate required twenty-four seconds and the gelatine plates from two to eight seconds, the latter were more than three times as sensitive. "I venture to think," he says, "that the recorded experiment goes far in the direction of the ten times assertion."

Printer.—The following method of printing on silk or satin will no doubt answer your purpose. First iron the material so as to remove all creases and inequalities; next moisten it with the following salting preparation :—

Benzoin	·80 grammes
Mastic	·50 ,,
Chloride of cadmium...	3·00 ,,
Alcohol	100 00 ,,

When dry, the material is ready for sensitizing in a solution of 1 part of silver nitrate in 9 of water. It may remain a quarter-of-an-hour in this solution, and, after drying, it may be once more immersed, and then re-dried. Exposure, toning, and fixing as for an ordinary albumen print. Stretch on frame to dry.

A Poor Photo.—As regards the removal of potassium nitrate, it will be a sufficient test to dry a little emulsion on a glass plate, and note if there is any trace of crystallization at the edges. The removal of the excess of bromide, the presence of which is generally necessary in order to secure clear plates, is best indicated by the sensitiveness of the emulsion. Coat a plate from time to time, expose while wet under a standard negative or sensitometer, and develop.

S. S. F.—In order to remove all possible chance of danger, it would be well to thoroughly moisten the "old tile" with strong hydrochloric acid, and then to dry it in the open air; this will probably reduce it to powder, or something near it. Heat this to redness in order to destroy organic matter, after which reduce by fusion with twice its weight of sodium carbonate. A three-inch flue ten feet high will be sufficient for the furnace you allude to, and the principal point is to take care that all air must actually pass through the fire, *via* the fire-bars. Coke in pieces about as large as walnuts will serve best.

An Assistant.—Please tell us the address of the Company; we wrote to Leicester, but have received no reply.

Photo.—Refer to our advertisement columns.

Beginner.—One specimen sent is good, but we advise you to destroy all except "the child with his dog protector."

Opal.—Try collodio-chloride of silver.

W.—It may be obtained of most chemists. We are glad our advice was so useful.

L. S.—1. We have already answered your questions. 2. Chrome alum.

P. H.—It will dissolve in benzole readily.

Novice.—The delay was unavoidable.

The Photographic News, December 17, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photo-Electricity of Fluor-Spar Crystals—Phosphorescent Substances for Lighting Mines—The Composition of Ammoniacal Silver Nitrate—New Investigations of the Action of Light on Plants—Pyroxyline Varnishes—Photographic Portraits, the Eyes of which Seem to Wink—The Testing of Potassium Bromide.

Photo-Electricity of Fluor-Spar Crystals.—Hantzel has communicated to the Saxon Royal Society of Science some interesting observations on the production of electricity by light in coloured fluor-spar. The centres of the fluor-spar cubes become negatively electric by the action of light. The electric tension diminishes towards the edges and angles, and frequently positive polarity is produced there. With very sensitive crystals a short exposure to daylight is sufficient; by a long exposure to light the electric current increases. The direct rays of the sun act much more powerfully than diffused daylight, and the electric carbon light is more powerful even than sunlight. The photo-electric action of light belongs principally to the "chemically active" rays; this is shown by the fact that the production of electricity is extremely small behind a glass coloured with cuprous oxide, and behind a film of a solution of quinine sulphate; while it is not appreciably diminished by a film of a solution of alum. The photo-electric excitability of fluor-spar crystals is increased by a moderate heat (80° to 100° C.)

Phosphorescent Substances for Lighting Mines.—Montigny has lately proposed to light mines by means of phosphorescent substances, the latter being made luminous in Geissler's tubes. Balmain's luminous paint spread upon moving endless bands has also been suggested.

The Composition of Ammoniacal Silver Nitrate.—As is known, many methods have been proposed for the preparation of bromide of silver gelatine emulsion, in which the silver nitrate must be mixed beforehand with enough ammonia to dissolve the precipitate first formed. The question now is, what reaction takes place by the addition of ammonia to silver nitrate? According to Prescott, nearly two molecules of ammonia are required for the solution of the silver salt, under the most varied conditions of temperature and concentration. The reaction that takes place here is represented by the following equation:

$$2AgNo_3 + 4NH_4OH = (NH_3Ag)_2O + 2NH_4NO^3 + 3H_2O.$$

New Investigations of the Action of Light on Plants.—Hamintzine has shown by a series of very interesting experiments that plants decompose carbonic acid in diffused daylight quite as energetically as in direct sunlight, and sometimes even more so; also in artificial light (a gas-flame equal to about fifty candles) a decided decomposition of carbonic acid by the leaves of various plants takes place. Different plants behave differently, according to the degree of absorption of light by their exterior cell walls containing chlorophyll. From this it follows that with many plants a certain intensity of light acts most favourably on the carbonic acid decomposition. By further increase of the intensity of light no greater quantity of carbonic acid is decomposed; in some cases even a smaller quantity. A gas flame (with au intensity equal to that of fifty candles) causes the decomposition of about a third as much carbonic acid as daylight.

Pyroxyline Varnishes.—Parkes, of Birmingham, has patented the manufacture of varnishes from pyroxyline. According to his method, pyroxyline is dissolved in a mixture of carbon tetrachloride and camphor, which is also mixed with gum, resins, oils, colouring matters, &c. Carbon bisulphide and camphor form also a good solvent. A mixture of camphor with benzole or turpentine, with the co-operation of pressure and heat, also dissolves the pyroxyline quickly. These solutions make very good varnishes.

Photographic Portraits, the Eyes of which Seem to Wink.—Bottzer describes the following pretty experiment. Two negatives are prepared of the same person—one when the person's eyes are shut, the other when they are open. Both negatives are pasted on opposite sides of a piece of transparent paper, so as to cover one another perfectly. If the double picture is now held before a flickering lamp, or any other flame or source of light of rapidly changing intensity, the combined photograph shows quick changes of opening and shutting the eyes, producing a most remarkable effect.

The Testing of Potassium Bromide.—Silver iodide is almost insoluble in a 10 per cent. solution of ammonia, and silver bromide is insoluble in a 15 to 17 per cent. solution of ammonium carbonate. Hager recommends the following experiments for the examination of potassium bromide in the *Pharmaceutischen Centralblatt*: 5 to 6 grammes of potassium bromide are finely powdered, and 0·1 gramme of the powder is dissolved in 10 to 12 cubic centimetres of ammonia; to this 1 drop of a solution of silver nitrate is added, and the mixture shaken. A turbidity not disappearing indicates the presence of potassium iodide. The test is sufficiently delicate. To test for chloride, 0·1 gramme of the powdered potassium bromide is dissolved in 2 to 3 cubic centimetres of water, and a solution of about 0·16 grammes of silver nitrate in 2 to 3 cubic centimetres of water is added; then 10 to 12 cubic centimetres of a solution of ammonium carbonate are added, the mixture shaken, and filtered after about ten minutes. The formation of a turbidity in the filtrate after neutralizing with nitric acid indicates the presence of chloride.

At Home.

THE VAN DER WEYDE ELECTRIC STUDIO IN REGENT STREET.

The lamps in Regent Street are lit, for the light fades early these short wintry days. It is still afternoon; the Quadrant is full of life; the gay costumes of the promenaders, now veiled in the mist of twilight, now made resplendent by the vivid illumination of the shops, lose none of their attraction, but, on the contrary, seem enhanced rather "between the dark and the daylight, when the night is beginning to low'r." Longfellow is not alone in loving the period; we believe every thorough-bred Cockney rejoices in this time between the lights, and it is the one thing that reconciles him to winter when it comes upon us. There is a feeling of warmth, of cosiness, of brightness, of snugness prevailing at such times, which dwellers in great cities always delight in, and which may be considered a set-off against the many advantages our country cousins enjoy.

"I like to stroll down Regent Street," says the song, and between afternoon and evening the sentiment appears to be a very popular one. It is Cattle Show week, and this may have something to do with augmenting the busy crowd of loungers that hustle one another upon the glimmering pavement before the bright shops and under the glittering lamps. It may not be "the season" in town; but London is full, for all that, and so bustling and animated a scene is rarely found at any other time of the year.

It is hardly a seasonable hour to visit a photographic studio, one would think; but we have purposely delayed our call. The card of invitation says any hour before 7·30 p.m., so we are in plenty of time. Mr. Van der Weyde's studio is in a magnificent position in the very centre of

Regent Street; and, of what Mr. Van der Weyde is very proud, it is under a slate roof. There is not even a skylight, lest the suspicion should gain ground that sometimes daylight is employed for photographic purposes. The Van der Weyde establishment is a winter studio *par excellence*, it might be said, only that, curiously enough, it is in summer when most of the work is done, for the simple reason that the London season is during the longer months. What strikes one, indeed, in looking over the portraits here, is that so many persons should be represented in evening dress; but the mystery is solved by the explanation that the ladies and gentlemen in question have been photographed in the evening before they sat down to dinner, or, maybe, after they came home from the opera. It is but the other day we read of the Prince of Wales being photographed, after having first passed the evening at the play, while it is not so long ago that Mr. Van der Weyde had a "call" from Captain Shaw, of the Fire Brigade, accompanied by a certain duke whose fire-loving qualities are well-known, the visitors arriving at midnight, and not departing till one in the morning. Whether they came to see if the electric studio were on fire is a moot question, but certain it is they were not permitted to go till some very excellent portraits had been taken.

M. Van der Weyde's series of Royal pictures is a large one; but, fine as it is, the collection of "professional" portraits he has made are the most attractive. Perhaps ladies and gentlemen who are in the habit of appearing before the footlights make better pictures with artificial illumination. Here is a portrait of Josef Gung'l, the composer; here is Toole, the comedian; here is Edwin Booth, and here is Henry Irving. All are clear, forcible, and brilliant—well lighted, and agreeably posed. Mr. Van der Weyde has discarded the dioptric or "lighthouse" lens he formerly employed, and of which a description was given in these columns some years ago. His electric light has a brilliancy equal to 6,000 candles, and is produced by a Gramme, or Siemens, machine, as may be found most convenient, for both systems find a place in the engine room. The engine is one of Otto's gas engines, Mr. Van der Weyde, we believe, having been the first to apply a gas engine to the evolution of electricity.

We walk into one of the studios. The most prominent object is a large cup-shaped reflector, in the middle of which is the electric light. This reflector is five or six feet in diameter, like the half of a huge globe, the interior being of white paper; it hangs loosely from the ceiling, and is provided with a handle, so that an assistant, who holds it the while, can direct the light as he pleases. As a rule, it reflects the light downwards on the sitter at an angle of something like 45°. The electric glow of the carbon points is not seen by the sitter, because a little saucer, situated just below the spark, intervenes, throwing the light upwards into the parachute reflector, whence it is reflected upon the sitter. Mr. Van der Weyde does not cover in his electric light by means of a sheet of thin paper (giving it the form of a kettle-drum inverted), as does Mr. Liébert, of Paris, and the Stereoscopic Company, but employs the full force of the light without subduing it by a medium. He is thus enabled to make very quick exposures. Cartes of children are secured in one or two seconds; while the cabinet portraits and promenade portraits, which are Mr. Van der Weyde's speciality, require but from six to seven seconds, gelatine plates being, of course, made use of.

The sitter is surrounded by white screens during the exposure, except, of course, on the side of the reflector; there is even a screen in front of the sitter, pushed, in the case of a vignette, to within a foot or eighteen inches of the model, an opening in the latter screen permitting the camera to peep through. There cannot be a doubt that, under some circumstances, a front screen—such as this—especially if it had movable wings, or reflectors at sides, top, and bottom, might be advantageously employed for day-light portraits.

A young lady is ready posed as we enter. Mr. Van der Weyde himself arranges the model, and directs the lighting. One assistant, holding the reflector, obeys his directions, while a second focusses, and makes the camera ready. The portrait is to be a profile, illuminated by an edge light, and the reflector is so turned that the white screen at the back—which serves as background—is cast somewhat in the shadow. We peep through the camera opening, and the effect is delightful. The lady is young in years and comely in face, and, as she sits there, the pure electric light flooding face and shoulders, and brilliantly illuminating her features, we are reminded of the good fairy in the enchanted island of dazzling light, or the pretty princess of the realms of brightness, with whom we all become acquainted about Christmas time.

In practised hands the reflector permits of a wide range of lighting, and it is the effects thus obtained that have had much to do with the success of the Van der Weyde portraits. Again, instead of being hard, or black and white, the fault inherent, one would think, to artificial lighting, the pictures, by reason of the skilful lighting, are soft to a degree, and Mr. Van der Weyde tells us he has never to retouch a high-light.

A little incident of the studio may here be mentioned. The lady would like a second picture, without her bonnet. There is no need to get up and go away to arrange her hair or head-dress; an elegant little toilet table on casters, with mirror and brushes, is pushed towards her chair, and, without moving, she can make her toilet as comfortably as in a boudoir. Not only is the lady not inconvenienced, but the photographer is not kept waiting. Mr. Van der Weyde always employs a loud-ticking metronome in the studio; as his source of light is pretty constant, if he accurately regulates the exposure, he is sure of securing negatives of equal density.

We mention the studio, but there are no studios in the ordinary sense of the term; the portraits are taken in two ordinary rooms, thickly carpeted and warmly furnished, and presenting little difference from sitting or drawing-room. The one is for groups, the other for single pictures; but, beyond the fact that in the former the reflector is rather bigger, the rooms are much alike. The dressing-rooms are well appointed, and in one of them was a large so-called Japanese mirror, a mirror such as many of our readers have seen, with folding wings, which, when opened at right angles to the front mirror permit the fair observer to see even the back of her head, if she likes. A looking-glass like this is a more handsome piece of dressing-room furniture even than a cheval glass.

It would take more room than we have to spare to describe adaquately the whole of Mr. Van der Weyde's fine establishment. Mr. Van der Weyde, as our readers know, is a painter of repute, scarcely a season passing that he does not exhibit at the Royal Academy; and in the reception room are to be seen several examples of his work. Indeed, not only as a painter, but as a soldier also, our "host" is known; and if we do not err, he fought through the last American campaign as Major Van der Weyde. But he has long ago exchanged the sword for the mahlstick, and the trophies he hangs on the wall are those of the artist, and not of the warrior.

Mr. Van der Weyde charges for sittings, and not for portraits. A sitting for the promenade portrait, including eight copies, is charged three guineas; for "cabinet," including twelve copies, two guineas; or, if large heads are desired, then a guinea more is the fee. Cartes are one guinea a dozen.

The "At Home" next week will be "At the Opening of the Bristol International Exhibition."

AN OPTICAL PHENOMENON.

BY CHARLES PEARSON, JUN.*

I wish to call your attention to a pheuomenon in optics that I have been observing lately. I do so more for the sake of eliciting information, and of ascertaining whether any member has previously noticed the same thing.

When an opaque object is held in a strong light—sunlight in particular—it of course casts a dark shadow on to any surface (that is, on the side opposite to the source of illumination). If the surface receiving this shadow is within an inch or two of the object casting it, the shadow is usually sharply defined at its edges.

The further, however, the surface receiving the shadow is removed from the object, the more softened and indefinite the edges become, until ultimately a point is reached when no shadow is cast at all.

Suppose we have an object a foot distant from a white surface on which its shadow falls, we shall then find that with sunlight, the softening or shading off of the edges of the shadow takes about a quarter of an inch, measuring from the perfect shadow, or "umbra," to the direct unobstructed light. This quarter-inch of toned light is known as the "penumbra." If this penumbera is observed very carefully, it will be seen that it does not graduate from the perfect shadow to the open light, but that at its extreme edge, where the shade is the faintest, there is a band of light actually brighter than the surrounding light.

The phenomenon will be seen easier if the object casting the shadow is kept slightly in motion; the stronger the light, the more distinct it is. I first noticed it when riding on an omnibus, as we moved along the road—the halo of light surrounded the shadow which was projected on to the footpath by the sun, from the omnibus and figures on it.

It was subsequently forcibly brought under my notice when walking in a hilly district on a fine bright evening, as the sun was getting low; in fact, the rays were almost horizontal, so that my shadow, instead of being cast on the road, would be thrown on to the side of a hill across a small ravine about 200 yards wide. Instead, however, of seeing the shadow there, moving as I walked, there was in its place a faint, though distinct light.

I explain these phenomena by the supposition that a small amount of light is reflected from the extreme edge of the object casting the shadow, because any object, however dull it is, will reflect some little light if the incident ray make a sufficiently acute angle with the surface it strikes on.

The shadow, being so far away, and so proportionately small, would be overpowered by the marginal light covering it, thus giving it the appearance described.

It has been customary to look upon this penumbra as the most perfect graduated shading we have in nature—in fact, we turn it to a practical account when we print our vignettes with plain cut-out masks. You may have noticed, as I have, that when a very dark object cuts against a moderately bright sky, a light fringe appears in the print on the sky, following the outline of the object.

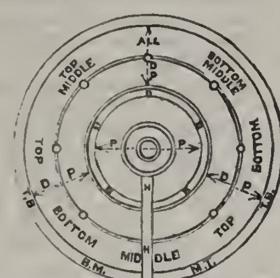
Hitherto I have been in the habit of ascribing it to the action of the developer, supposing that that portion of the liquid over the dark part not having anything to develop (as the negative would be clear glass there) would be more active on that part of the sky nearest it; but I am now inclined to think it is owing to the presence of this band of light round the dark object that causes it. In a transparency to be exhibited later on of Hawarden Old Castle, this pheuomena is seen very distinctly. The picture, however, had to be printed rather dark to show the lighter portion. It is a well-known and, at the same time, curious fact, that photography can render the half-tones in the shading of an object, which would never be seen by an untrained eye.

A MODIFIED LANTERN.

BY REV. W. F. FAULDING.*

Some years ago I was about to purchase a triple lantern, but, being anxious both to operate and lecture at the same time, I desired that my lantern should be under the control of one tap; this advantage, I was told, though possible and customary for bi-unials, was not practicable for triple lanterns. My feeling was so strong on the point, that I determined to discard the idea of a triple lantern, unless by means of one connecting tap it could be "tri-unial" as well as "triple."

Having spent two or three days (or rather nights) in considering the matter, I was able to furnish my optician with drawings, and a model from which, with very great care and skill, they produced such a tap as was wanted. This tap having now been in use with perfect satisfaction for three years, and having been reproduced for other lanterns, both for England and America, I will now describe.



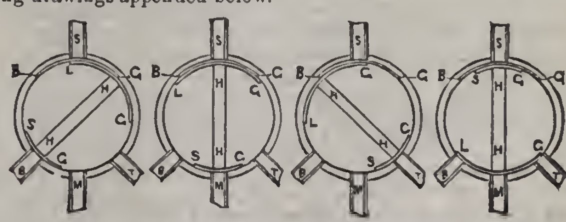
View of front of tap showing dial plate.

In the above drawing (which is not exactly to scale), P P represents the plug of the tap, B B B the barrel of the same, while the piece of metal round it marked D P is the dial plate. This dial plate cannot well be seen in the dark, and is not at all necessary to the experienced operator, but it is useful for the young beginner to learn by; it is interesting to those who come to look at the lantern, and it is, moreover, an ornament to the tap. H H is the handle by which the plug is worked. It will be noticed that just inside the printing is a small groove running all round the dial-plate, and at intervals there are small circular indentations; in this groove works the end of a small spring indicator, which tells the hand of the operator whenever another stage has been reached in the revolution of the plug.

Let us now follow the handle through one revolution going round in the direction of a watch. In the drawing, the handle is directly over "middle," the first point is B M, when the bottom and middle lanterns are supplied, the next is "bottom" only, the next T B, for top and bottom, the next "top" only, the next "top and middle," the next "all," which indicates that at that point all the lanterns are supplied; then follow in succession "bottom and middle," "bottom," "bottom and top," "top," "top and middle," and, at last, "middle," the starting point.

It will thus be seen that the tap can send gases to *any one*, to *either two*, or to *all three* lanterns by the simple revolution of one plug; but a moment's study of the drawing will show that the tap can do these things in more ways than one. In other words, the tap proved more useful than the inventor anticipated, for it has two ways of reaching the bottom lantern, two for the top, two for the top and middle, two for the middle and bottom, and two, also, for the top and bottom; while it has one way for reaching all the lanterns, and one for reaching the middle. Thus any combination may be effected, any lantern reached direct by the one tap, if a picture and effect occupy two lanterns; a new picture may be introduced without removing the effect, or a picture with two effect sides may by shown, or, in case the burners of one lantern should get out of order, the other two lanterns, no matter which, can be worked as a bi-unial.

It may be thought that a tap able to do so much would be exceedingly intricate and difficult to work; such is not the fact—it is as simple as a bi-unial dissolver, as will be seen from working drawings appended below.



View, showing a transverse section of the tap through the centre of the supply and delivery pipes for one gas, and exhibiting the plug in four different positions, in which S S S S, are

* Read before the Manchester Photographic Society.

supply pipes; B B B B, pipes for bottom lantern; M M M M, pipes for middle lantern; T T T T, pipes for top lantern; B G, is a groove in the barrel of tap; L G is the long groove in plug of tap; S G is the short groove in plug of tap; H H is a hole bored through plug of tap. The barrel groove is to ensure a supply of gas in all positions of the plug. The hole through the plug is to send gas from one groove to the other. Now, it would be easy enough to send gas to *any one* or *any two* of a dozen lanterns if only the tap were big enough in the barrel; the difficulty was to send gas by one tap to one, two, or three lanterns at pleasure; this is overcome by a long and a short groove in the plug, exactly opposite to each other, and communicating by a hole through plug. It will be seen that these grooves move with the plug. The short groove may cover the hole of one pipe, or, at most, of two; the long groove may cover one, two, or three pipes, but is too long to cover the middle pipe only (hence the necessity of the short groove). In the first three of the four drawings above, the short groove is exactly over one or other of the three lantern pipes, but in the last figure the long groove is exactly covering all three lantern pipes; hence in that position the gases would be travelling to all the lanterns. Nothing more need be added, except:—1, that what is shown above is repeated half-an-inch further back than the surface of drawing for the supply of the other gas; 2, that in order to keep a jet of gas burning in the unused lanterns, a very small groove is cut all round the barrel just opposite the hydrogen supply; this groove, however, is too small to show in the drawing, and does not in any way interfere with the grooves before described.

I may add, I have no commercial interest in publishing the above; but as Messrs. Ottaway and Son, of St. John's Street Road, have always served me exceedingly well, and have, moreover, gone with great care into the details of this tap, I would recommend all who think of procuring this dissolver to apply to them.

ON THE USE OF THE ALUM BATH WITH GELATINE PLATES.

BY VALENTINE BLANCHARD.*

I shall not take up your time long, and will simply say that when anyone is working the gelatine process, and finds out something which may be of value to others, he is bound to make it public. The experience of mine to which I wish to call attention was the result of an accident, but it promised so much, and seemed to give such a new power to the gelatine worker, that I made further experiments, and having shown the results to others, their opinions have emboldened me to come forward and give the details. I was using an emulsion with pyrogallic acid, and one of the negatives so produced was of the well-known yellow colour, and extremely dense. Thinking it was useless, I placed it in the alum bath, and there it was left until the following morning, when on taking it out I was astonished to find the yellow colour was removed and the density reduced, resulting in one of the finest negatives I have ever seen. I showed the negative to Colonel Wortley and to Mr. Mawdsley, who were both surprised, as nothing of the kind had been seen before. I repeated the experiment by leaving a yellow and dense negative in the alum solution from Saturday until Monday morning, when exactly the same result followed. The advantages I draw from the use of this method are three in number—first, the power to remove the yellow colour; second, the power of reducing density, the reason for which I leave the chemist to decide; third, and perhaps as important as the two others, the fact that the alum hardens the gelatine so much, that it dries almost immediately, and entirely overcomes the greediness for moisture which is the drawback of the gelatine process.

In reference to this subject Captain Abney writes:—

"It may be also interesting to note that prolonged immersion of the negative in the hyposulphite bath answers the same purpose, as does also immerson in a solution of peroxide of hydrogen. In all cases it is a dye which is removed, and a dye of a definite composition, which attaches itself to the organic matter of the plate. Alum has a great affinity for many dyes, and hence abstracts them. Hyposulphite appears to act as a bleaching agent, as of course does the peroxide of hydrogen. The only density that is taken away from the plate by the alum is the density produced by the dye and nothing else, and the same density which was destroyed, can apparently be given a negative by re-dyeing the film. I may mention that the useful office of alum has been known for some time to many photographers, myself amongst the number, and Mr. Blanchard was very happy in having given the wrinkle to the Society in general.

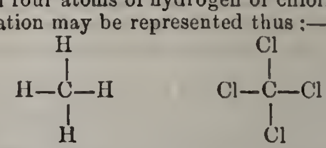
* Read before the Photographic Society of Great Britain.

ON THE APPLICATION OF PHOTOGRAPHY TO CHEMICAL RESEARCH.*

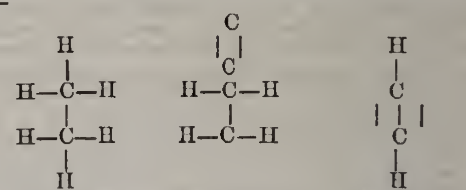
BY W. N. HARTLEY, F.R.S.E., ETC.,

Professor of Chemistry, Royal College of Science for Ireland, Dublin.

The most interesting part of the research, however, was that relating to benzene and its derivatives. In benzene there is a group of six carbon atoms, linked together in a peculiar fashion, and these form a nucleus of an exceedingly stable or persistent character, capable of withstanding the energetic action of powerful reagents such as nitric acid. There can be no doubt that the insusceptibility to decomposition which belongs to benzene derivatives—or aromatic compounds, as they are also called—is due to their peculiar structure. This peculiarity may be explained in the following way. An atom of carbon can combine with four atoms of hydrogen or chlorine, and each such combination may be represented thus:—

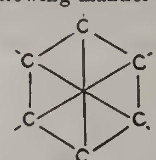


We may, then, imagine a compound in which two atoms of carbon are united, and then combined with hydrogen; and the structure of such compounds may be represented thus—



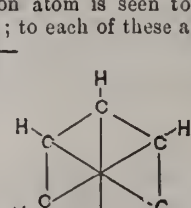
Carbons singly linked. Carbon doubly linked. Carbons trebly linked.

If, however, we increase the number of carbon atoms, the various ways in which they may combine will increase, but it simplifies matters if we assume that in all aromatic compounds—that is to say, bodies containing the carbon nucleus of benzene—the structure of the nucleus may be represented in the following manner:—



Carbon nucleus of benzene.

Here each carbon atom is seen to be united to other three carbon atoms; to each of these an atom of hydrogen is linked, as below—



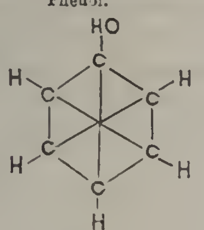
The very recent researches of Professor Julius Thomsen have shown that this representation is the most correct

* Continued from page 580.

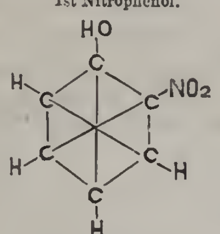
one; it differs slightly from the figure to be seen in most text-books on organic chemistry.

Now the great difference between benzene derivatives and other forms of carbon compounds is, that the spectra of the former are remarkably short. 2. Being liquid or solid bodies, when they are dissolved in, and enormously diluted with, some transparent fluid—such as water or alcohol—they show the presence of absorption bands, that is to say, intervals or bars, which intercept the chemical rays. These bands are caused by the peculiar grouping or linking of the carbon atoms. It follows from this that if the chemical constitution of a substance be unknown, we may readily ascertain by photographing its absorption spectrum whether it contain the benzene nuclus as the basis of its structure, because, if so, characteristic bands will make their appearance. More than this, from the character of its transmitted spectrum being similar to that of some body of a known constitution, we may ascertain whether it is an allied substance or not. This is a matter of the greatest possible importance, for if we know the constitution of a body, we have half conquered the difficulty of forming the substance artificially. The most transparent of substances containing the benzine nucleus—namely, benzene itself—withstands a dilution with 2,400 parts by weight of alcohol, without the bands of absorption disappearing. These, however, are not all the peculiarities of this class of compounds. It is well known that they form numerous isomerides—or compounds—identical in chemical composition and constitution, but with a difference in molecular structure, which difference is marked by their physical properties being different. Amongst such compounds we have three nitro-phenols. Now a phenol is a benzene molecule, in which hydroxyl replaces an atom of hydrogen; and a nitro-phenol is one in which two atoms of hydrogen are replaced; the first by hydroxyl, the second by an atom of nitrogen, linked to two atoms of oxygen, and called nitroxyl. The difference between the first, second, and third nitro-phenols is supposed to be due to the relative positions of the two groups of atoms OH or thydroxyl, and NO_2 or nitroxyl. In representing these three substances by the formula made use of before, we obtain the following figures:—

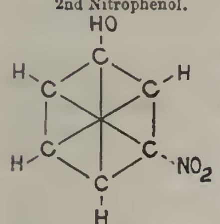
Phenol.



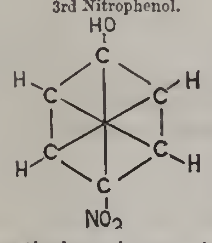
1st Nitrophenol.



2nd Nitrophenol.



3rd Nitrophenol.



Without entering into forther particulars, it may be stated that isomeric substances yield very different spectra.

In conducting these researches, a method of showing the nature and the extent of absorption of substances was employed which had not been used by previous observers. It consisted in knowing the exact thickness of the layer of liquid examined, and the exact proportions of the transparent liquid used as a dilutent; diagrams were then drawn from the photographs taken, which show the position of the absorbed rays in solutions of various strengths. Thus, in the diagrams of benzene, we can see the effect produced by a layer of liquid fifteen millimetres in thickness, or less than three-quarters of an inch, in any stage of dilution from one part of benzene in fifty of alcohol to one part in 2,400. In other cases the range of dilution extended to as much as one part of substance in five or even ten millions of the solvent.

Professor Huntington and myself examined a large number of essential oils, and found that they rarely exhibit absorbtion bands, which shows that for the most part they are not benzene derivatives. These oils, which transmitted spectra showing bands of absortion, were known from the previous researches of other chemists to contain benzene derivatives.

We were led to this part of the research on account of the great extent of the chemical and physical research which has been devoted to this class of bodies, partly because of the doubt which existed as to their precise constitution, and partly because many of the oils are articles of great commercial value, which makes them subject to adulteration.

There is one substance, cymene, a benzene derivative, which is readily produced by chemical reaction from essential oils, that is to say, the oils themselves which are classed under the name of terpenes are easily converted into cymene. Now, cymene exhibits a well-defined and easily-recognised absorption band, and it was found that many essential oils contain cymene as a constituent. More than this, by noting the intensity of this band the proportion of cymene present was ascertained.

In conclusion, I may add that spectrum photography can be employed as a means of identifying organic substances, and as a most delicate test of their purity; hence the method of research here shortly described is capable of very extensive application in chemical analysis.

Some of the advantages derived from the employment of photography in the study of spectra are the following:—The measurements are free from any personal error; the photographs are permanent and unmistakable records easily referred to; and the observations are made more rapidly and with much less fatigue to the eye than by any other means. When the apparatus is once properly adjusted, but little skill is required in making observations. By lengthening the exposure of the photographic plate, rays too feeble to be seen either on a fluorescent screen or by means of a fluorescent eyepiece are easily reproduced.

I believe that photography of the *ultra-violet* rays is the only means by which spectra can be properly studied, since the most characteristic lines of metallic spectra lie beyond the region of the luminous rays.

There is one conclusion of special interest to photographers which I have arrived at. I believe it to be perfectly possible to obtain a medium which will transmit white light, but intercept all chemically active rays. Liquids are known which almost fulfil these conditions. Perhaps at a future date another communication on the subject may be forthcoming.

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REVERSED IMAGES ON GELATINE PLATES.

In our article of last week we referred to the apparently insurmountable difficulties which would present themselves in connection with the making of plates requiring an exposure of perhaps one-hundredth of that usually given; but perhaps it might be possible to prepare such plates in the usual manner, and then to treat them with some reagent capable of undoing the work of that light which may have acted on them during their preparation. Our readers will remember that Captain Abney proposed potassium bichromate as a substance to be used for undoing the work of light. If this reagent should prove unequal to the task, perhaps other more active oxidising agents may be pressed into service.

In the concluding paragraph of the article already mentioned, we referred to the circumstance of a positive being produced simultaneously with the ordinary gelatino-bromide negative as usually made. This may be very distinctly seen during development if the back of the plate be examined; and by the time the negative image is fully brought out, and has acquired the requisite degree of vigour, this positive image usually shows as a perfect picture, having all the gradations and detail of the original object. If the plate be now thoroughly washed in the dark room, it may be carried out in the light and examined. It will then be seen that there are two complete pictures—one a positive, and the other a negative; the former being on that side of the film which is in contact with the glass, while the latter is on the outside surface—or, rather, we should say, in the outside surface. As, in all ordinary cases, the negative image is the more vigorous of the two, the result of fixing is to overpower the weaker by the former, at least when the result is viewed as a transparent picture; but even after fixing, the positive image can generally be traced, as it is somewhat whiter than the negative picture. If the plate is exposed through the glass, instead of on the film side, the order of things will be reversed, the negative being next the glass, and the positive on the outside surface of film. Under these circumstances the positive image is much more vigorous in proportion, possibly from the fact of the developer acting more directly on it. We do not propose at present to theorize on the matter in question, as, before doing so, it may be desirable to gather more facts bearing on the question; but we will merely put forward the following notions as perhaps bearing on the question. Those who read our article of last week will gather that we regard an ordinary gelatino-bromide plate, such as is usually made use of in the present day, as having been exposed to sufficient light (or other analogous influence) to cause a certain general reduction when exposed to the action of a powerful developer. Assuming this to be the case, and that the normal action of light consists in the liberation of a certain amount of bromine, with the production of a corresponding amount of metallic silver or basic bromide, it becomes easy to understand the whole affair. The silver bromide near that surface of film which is next the source of light is decomposed, and the liberated bromide strikes deeper into the film, and bromises to the maximum those portions of the already partially reduced bromide which are farthest from the source of light.

The whole subject of the reversal of the image is one, however, which well deserves a careful study, and we have but little doubt that the experiences of our numerous readers in this direction would add much to the stock of knowledge on this subject. It is to be hoped that our readers will take the hint and come to the fore with their observations.

GELATINE DRY PLATES.—LONG EMULSIFICATION AND BOILING.

Which is the best method to follow in preparing gelatine emulsion? Is it advisable to prolong digestion at a low temperature, or to shorten the process by boiling? These are questions more frequently asked, than satisfactorily answered.

Under certain conditions, no doubt can be entertained that the two methods will produce emulsions in no way to be distinguished the one from the other. This may be settled by making a quantity of emulsion (we have made the experiment more times than one), and dividing into two portions, one of which should be boiled, or rather raised to a high temperature for a fixed time; the other half should be emulsified at a temperature of 90° Fahr. for a given number of hours.

After repeated trials, we came to the conclusion that by accurately noting time in boiling, the maximum temperature reached by the emulsion, and the time it was kept at that temperature, we could make tolerably certain of our results. Although the operation of boiling occupies only as many minutes as the long process does hours, it does not follow that it is a haphazard "rule of thumb" method of obtaining a specific end. Let it first be clearly understood what is meant by "boiling." The term is altogether vague and unsatisfactory. So far as our experience goes, it is unnecessary and undesirable to boil emulsion for "half-an-hour"—that is, to keep it for that time at 212° Fahr. It is unnecessary, because the end may be compassed at a temperature lower by twenty or thirty degrees, and in a shorter time. Should boiling be carried out literally for half-an-hour, the result—with some of the commercial gelatines, at least—would inevitably be fog. We will indicate, further on, the method which, in our hands, succeeded in producing a sensitive and sound emulsion.

By carefully noting time, temperature, &c., there need be no great difficulty or uncertainty in making a "boiled" emulsion, and in repeating the process with a uniform result. The same may be said of prolonged digestion at a low temperature, with this important difference, that risk of failure is greater, especially in summer.

During the hot months of the year, when the air is warm and humid, a thunderstorm will completely wreck one's calculations, and reduce the best emulsion to a fog-producing, frilling, useless compost. There is no safeguard against this decomposition, unless we could insulate the emulsion, and protect it from electrical disturbance.

Gelatine is exposed to the same risk by the short method in a modified degree. It is also equally liable to decompose by over-cooking.

Admitting that the two methods are fitted to produce equal results, by adopting the shorter of the two there is a manifest saving of time and labour. There is still further economy effected if, by its means, we minimise the risk of failure.

To boil emulsion successfully, we assume that the operator fulfils the conditions upon which success depends. Some of these conditions we will briefly notice. The primary need, to start with, is a reliable formula in which

the combining proportions have been properly worked out, and having the bromide or bromo-iodide salts in excess. In order to frame trustworthy formulæ, some chemical knowledge is required; but where such knowledge is wanting, and where original experiment might only fog the operator and his plates, there is a store of published formulæ available for all. The next condition of success is to make a proper use of the formula when once decided upon. There need be no difficulty in procuring pure chemicals. The greatest stumbling block is gelatine. "Coignet's" is excellent. It is safe not to cause fog or frilling, and it is equally sure to break out in the "zymotic," or chronic disease whose virus appears as "opaque spots"—a trouble about which we may have something to say on a future occasion.

During winter, and, under proper treatment, even in summer, Nelson's photographic gelatine answers admirably. Its fitness, however, depends, to some extent, on the condition of the salts employed. When the emulsion has been mixed, it should show acid reaction. It should slightly redden litmus paper. Where the reaction is alkaline, there is danger of developing fog by boiling. One or two minims of dilute acetic acid has proved advantageous in our experience when dealing with neutral solutions. The acid should just be sufficient to bring a blush to litmus paper. Alcohol in the proportion of one drachm to five ounces of emulsion is also useful as an antiseptic.

Another condition to be observed in boiling is keeping at least three-fourths of the gelatine in reserve. This confers a two-fold advantage. Excess of gelatine retards the digestion of the bromide of silver. It yields a finely-grained emulsion, but not so sensitive as when the minimum of gelatine has been used. Again, it is understood that "boiling" gelatine for any length of time tends to diminish its power of setting. The residue of fresh material is therefore needed to replace the lost power.

We have said that half an hour's boiling is unnecessary as well as dangerous. It is safer to shorten the time, and supplement digestion by following Dr. Eder's plan of adding ammonia to the emulsion after boiling. The whole of the gelatine should be first added, and the emulsion kept at about 90° F. for (say) two hours, after which it may be chilled, and washed in the usual way. Emulsion thus treated with ammonia adheres well to the plate, and proved, in our hands, extremely sensitive, yielding full and delicate negatives.

We have touched upon some of the conditions of success, but the process is hedged round with a host of small troubles which can only be overcome by patience and experience. It is impossible to suggest remedies for all phases of failure. We can only offer a helping hand to our fellow-workers in the new field.

Notes.

Mr. W. J. Wilson, of Hammersmith, is a fortunate man. To him has been awarded the £50 Paget prize in the dry-plate competition, the jury deeming the process a good one, if not of surpassing excellence. In any case, it is a splendid prize, if it is not a splendid process.

John Chinaman is to the fore in photography. In the Rue Quatre Septembre, in Paris, a native of the Flowery Land will sell you camera, lens, and stand complete for twenty-four francs. The stand which we had in our hands on Tuesday night—Mr. Whaite was good enough to show it us—was a bamboo, enclosing two hollow tubes of steel, which, put together, form a tripod. The camera is fashioned for the most part of silk, and the lens—well, the lens is less good than the rest.

Mr. George Tuohy, of Richmond, has been taking his camera into the ball-room; and some pictures which are very interesting from several points of view are the result.

We do not mean to say that this adventurous operator secured drop-shutter photographs of dancers in motion; he evidently just told the guests to step towards yonder end of the room, and then exposed to the extent of 10 or 15 seconds. Certain cross shadows, which don't quite agree with the gas chandeliers, make us think of white fire, or some such composition, being burnt low down on each side of the camera.

White fire, or no white fire, the results are extremely interesting, and prove the practicability of securing pictures of certain phases of life and character to which the camera has not hitherto been commonly directed. Some of the figures and groups in Mr. Tuohy's pictures might be of considerable value to an artist. A very young man and his partner standing towards the right hand side of one of the pictures form about the finest representation of extreme "spoondom" which we remember to have seen—quite an artistic study. Follow up this line of work, Mr. Tuohy, and let us see the results of your future efforts!

Mr. Henderson has made a most interesting experiment—indeed, it bids fair to turn out something far more valuable than an experiment—in connection with the production of extraordinarily rapid emulsion. He has found that if phosphorescent sulphide of calcium in a fine state of division is mixed with bromide emulsion, the sensitiveness of the latter is highly exalted.

Mr. Henderson triturates the sulphide in a mortar, adds a little glycerine for convenience sake, and then gradually mixes the same with his emulsion. The difficulty naturally is to keep this prepared emulsion from the action of light, for coloured rays of all kinds seem to act upon the calcium, and this, once phosphorescent, sets up an action upon the bromide in the emulsion. Mr. Henderson does not profess to have satisfactorily solved this last problem, but freely makes public the fact, so that those who wish, may work upon it.

The number of reducing agents that have been suggested since the birth of photography as suitable for developers is rather numerous, although those of established worth are indeed few. An infusion of nutgalls, which paved the way to pyrogallic development, was, as all the world knows, suggested by Reade in 1839. The use of protosulphate of iron is due to a suggestion of Hunt in 1844, the possibility of employing ferrous oxalate being also mentioned by him in the same year. The employment of persulphate and ammonio-citrate of iron in photography was, however, made public by Herschel in 1840. The development of the bitumen image—Nicéphore Niépce's first process—by means of essential oil of lavender, dates from 1814.

Mr. Bolas has devised a little apparatus which may well be termed a detective camera. To all appearances, it looks like a shoe-black's block, a rough, square-shaped box, which may be slung over the shoulder with a strap, or rested upon the pavement, if need be. In fact, when wanted for work, it is put down on the ground. It carries gelatine plates already in position, with a lens that is always in focus for any distance from twenty to thirty feet.

The camera may be used without the least fear of discovery. It may be dropped in the street in the middle of the pavement, before a shop, upon a bridge, any time the owner sees a group he wants a picture of. As the box touches the ground, a bulb is squeezed, and the exposure is made. We have seen an instantaneous sketch taken on board a steamer of two men by the paddle-box, one of them rubbing his forehead in the most innocent and unconscious manner, while the other relates some story or incident.

Such a camera would frequently be of use. We should like to have had it some years ago, when we were in Yorkshire, and desirous of getting a view of the well and yard of Dotheboys Hall—the well, it may be remembered, whence the boys and Nicholas Nickelby drew water for the laundry on cold mornings when the pump was frozen. The good people at Bowes do not look with favour upon prying strangers; and at the straggling stone-built edifice at the end of the village, which served Dickens as a model for the "Hall," they were particularly ungracious. In fact, in the end, it was necessary to take the picture without leave, and this was done by setting down the camera *à la* Bolas, and looking another way.

Dr. Schnauss does not avail himself of artificial warmth to dry gelatine plates; he prefers to have his drying cupboard fitted with a receptacle containing either calcium chloride or sulphuric acid to absorb the moisture.

The Journal of the Chemical Society calls attention to the preparation, by an Italian chemist, of a new compound termed—tetrabromodibenzyleneparadimethylphenylamine. It is derived, we are told, from dibenzyleneparadimethylphenylamine. In the limited space of a "note" we are quite sure our readers will not expect to find anything beyond the names of these wonderful bodies.

The *Morning Chronicle* gives a long account of "Naturally Coloured Photographs," by the process, we suspect, that has already been described in our columns. It appears that "photographs coloured by artists, however clever, must be more or less 'monotonous, hard, untrue to nature and to the originals.'" One would obviously infer under the circumstances that the "naturally coloured" pictures had been operated upon by persons who were not artists, if the same well-informed journal did not distinctly assure us that "the colours are produced by the action of light alone in the camera." Becquerel, Niépce de St. Victor, and Abney—where are ye?

Topics of the Day.

A PANORAMIC LANTERN.

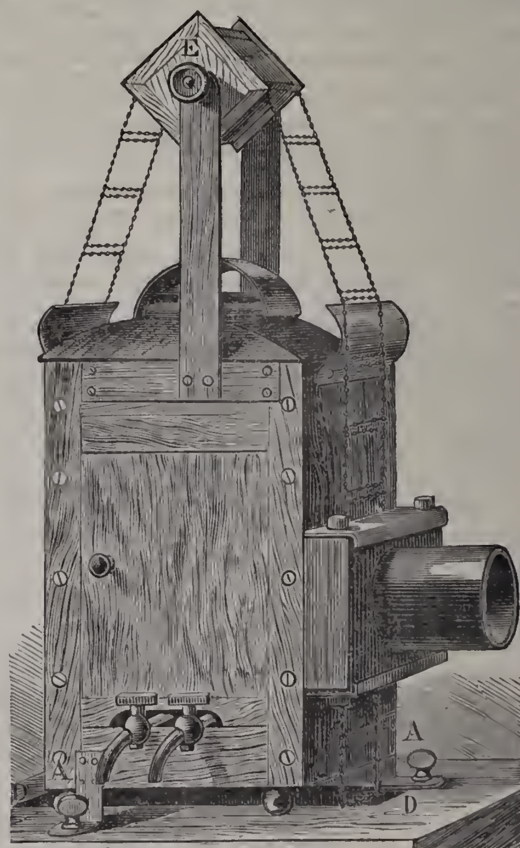
BY J. THOMSON, F.R.G.S.

Although I have published an account of this modified lantern in the pages of a scientific journal, it occurred to me that a brief resumé of the subject would prove of service at this season of the year.

The instrument may be termed a "Panoramic Lantern," since by a simple mechanical arrangement the slides follow one after the other in consecutive order. The arrangement entirely obviates the risk of regaling an audience with inverted scenes and slides introduced out of sequence. Accidents, these, not unknown in lecture halls, and incident upon the carelessness or comic proclivities of an operator. Such mishaps may peradventure be turned to good account when the showman is a man of resource and ready wit; but, in the main, the advantages to be derived from such accidents are so purely negative as to be objectionable, unless they form part of a well-digested plan.

The panoramic arrangement may be used alike with bi-unial or single lanterns.

The Packing Case.—The instrument is designed for portability, the case forming the stand to which the lantern is attached. The base of the instrument is so arranged



that it may be set on the top of the packing case and fixed to the lid by means of three milled-headed screws.

When in position, the lantern may be depressed or elevated by lowering or raising the lid of the case. When the instrument is properly centred so that the illuminated disc falls on its allotted space on the screen, the lid is fixed in position by means of wooden wedges. It is, of course, assumed that the screen is so angled as to present a plain, parallel to the stage of the lantern. Supposing that the

instrument is of the ordinary type, and carries a single objective, the slides would be passed through the stage horizontally from right to left. But in the panoramic form, the slides are required to pass downwards through the stage; in other words, vertical is substituted for horizontal action. The object of this change is the introduction of a band or ribbon of slides in lieu of a single slide.

In order to secure this end, two metal uprights are attached, one to each side of the lantern, long enough to clear the chimney. Each upright, at its apex, is pierced with a hole designed to carry a transverse rod. A wooden cube is constructed, each side of the cube corresponding in size to the dimensions of the slides. The rod is passed through the centre of the cube, and so fixed that its ends project about one inch on each side. The ends of the rod are passed through the holes in the uprights, the rod thus forming an axis on which the cube revolves. The object of the cube, so placed, is to carry a ribbon of slides which fall over the back and front of the lantern.

But the question naturally arises, How dispose of this band of thirty or forty slides? In front and at the back of the lantern, the lid of the case on which the instrument stands is pierced with an opening through which the ribbon falls.

The Ribbon.—The band which carries the slides is made up of several yards of strong linen tape. There are in all four bands of tape, two at each side of the slides. Each double band is stitched at intervals corresponding to the width of the slides. There is thus obtained a double series of loops, each loop made to fit tightly over the end of a slide. In this way the transparencies are fitted into the loops, and supported by the two tape bands. To prevent dislocation, the bands are glued down to the glass slides. Between each slide about three-eighths of an inch of the bands are stitched together so as to admit of the series being folded up like a Siamese book.

At one extremity of the panoramic series two metal rings are attached to the bands, while at the other extremity two swivel hooks are fixed.

When setting up the lantern for use, the ribbon of slides is passed into the packing case through a small doorway at its base. The two ends of the ribbon are then brought up through the apertures in the lid, one end being passed through the stage in front of the condenser, while the other is carried from the back over the cubes. The ends of the ribbon are then united by the swivels and rings, and so one endless band is obtained. By turning the cube, to which a milled-head is attached, the entire series of slides may be made to pass through the stage of the instrument.

The Stage.—The stage is supplied with carefully adjusted spring bearings, faced with chamois leather so as to minimise friction when the ribbon is in motion. The ribbon, with the same end in view, is also rendered vertical in front and at the back by two convex sheets of brass, the convex sides impinging upon the slides. These brass bearings are fixed to the front and back on the top of the lantern.

Although a written description of the panoramic lantern is necessarily tedious, the instrument in itself is as simple as it has proved effective in my hands. By its use the lecturer may feel much at ease about the sequence of his slides. He may indeed proceed blindfolded to deliver his discourse, feeling assured that his points are made on the right pictures, and that his optical illusions do not include nature "topsy-turvy." To say the least of it, it is unpleasant to find, when recounting your travels, that you have arrived at the wrong place; that the scene whose beauty you have been eulogising is not forthcoming; that your wanderings and your geography have got out of order. In your extremity your audience are fain to gaze upon the blank disc, expecting possibly to hear of travels in the moon, until the lucid interval arrives when your operator finds his slide, and you pursue your way through scenes terrestrial.

The use of the cube reared above the lantern is twofold; it supports the ribbon, while at the same time each side of the cube supplies a secure resting place for the slides.

The instrument offers another advantage, and it is this. By turning round the band prior to the time of exhibition, the slides get warmed, so that they do not condense vapour on the surface when placed before the condenser. In practice I have found that the ribbon may be made to hold a large number of slides. They fold up and rest on the base of the packing case, and unfold by simply turning the milled head of the cube.

The "Topic" for next week will be "The Moot Point in Emulsion Making," by Dr. J. M. Eder.

A FEW FACTS FOR AMATEURS.

BY W. H. PLAISTER, M.R.C.S.

Fourteen years' dabbling in amateur photography, and numerous experiments with gelatine emulsion, prove to me more and more that the art is only in its infancy, and that any facts observed may be of interest, if not of use, to your numerous amateur readers; and whilst I am in the humour I will just jot them down. After repeated experiments and observations, I have come to the conclusion—

1. That the most reliable emulsion for coating plates is that made according to Capt. Abney's formula, as given in his latest work on the process. I have generally tried all the formulæ that crop up in the News, and I am convinced that, by carrying out Abney's instructions, I get greater rapidity, more density, and more reliable plates.

2. That by using all Nelson's No. 1 gelatine, I get a much clearer plate, and that, with such weather as we are now experiencing, there is no necessity for Coignet's or any other opaque kind; thus obviating the risk of grease spots and other abominations. It appears to be muggy weather that affects the setting property of gelatine. If you ask your cook, she will tell you she is obliged to put more gelatine, or the blanc-manges in the kitchen would never set, during hot summer weather.

3. I boast that I never get a frilled plate; I know not why, but I don't. If the weather be dry and cool, I find there is no necessity for chrome alum. So I suppose the capriciousness of gelatine has much to do with the production of frill and blister.

4. I always dry my plates by alcohol (or methylated spirit). I do it for convenience and for safety, as I use the drying box. I find no decrease in sensitiveness.

5. I have just taken to ferrous oxalate developer, and consequently get clean hands instead of stained ones as by pyrogallic, and my nails don't go into mourning. It is the simplest thing in the world to make; a handful of ferrous sulphate put into a bottle, and ditto of potassium oxalate into another bottle, and each filled up with water. One part of the former to three of the latter gives one of the pleasantest and most efficient developers it is possible to have. *Mem.*—Always fill up the bottle after taking any out, and keep well saturated.

6. About a lamp. When I first began dry plate work, I was induced to buy a lamp "which, owing to the great sensitiveness of the gelatine film, was suitable for development, and warranted non-actinic." I was delighted with this instrument till I used it, when I found that its efficiency consisted in getting so hot that nobody could touch it, and that I could print a transparency by it in three minutes, and I hereby give notice that anyone can have it free gratis for nothing, by coming after it. But I learnt one thing from this, which was that one cannot be too particular about the quality (not so much quantity) of the light. It is a mistake to suppose it is necessary to work in the dark, or that a stray ray of light darting from behind the lamp against wall or ceiling will injure the film, unless it plays for some minutes on the film. I find that certain non-actinic paper I can buy is perfectly safe for the most sensitive film. But the light should

always be tested, or else fog will be attributed to all sorts of wrong causes.

7. In coating, the plates should always be removed away from the light as soon as possible.

8. A developed plate can be always kept unfixed for an indefinite time if well washed and kept away from the light. This is a great boon to those who, like myself, do not get much time, and who take up photography as a hobby.

9. Four or five ounces of ferrous oxalate developer will suffice for a dozen or more half plates, and this is another advantage over pyrogallic, which ought to have a fresh solution for each plate.

10. I find it is impossible to wash the plate too much after fixation, and it is well to let it soak some minutes in water, and then in an alum solution, to entirely eliminate the hyposulphite.

11. Intensification is a makeshift, but if it be required, I like the formula Wratten and Wainwright suggest on the form they send out with their plates. Mercury is more suitable for buildings and landscapes than for figures. I know nothing about pyrogallic and silver, but intend to know more about it after reading the last edition of our paper.

12. Last, but not least—cleanliness. Let every measure and every dish be applied to its proper use.

I repeat, the aphorisms are for amateurs, and "when I ope my mouth, let no dog bark."

Correspondence.

SELENIUM PHOTOMETER.

Dear Sir,—I see that your correspondent Leon Vidal is working at a selenium photometer.

It may be interesting to your readers to know that at the meeting of the Society of Arts, held on the Wednesday before last, when Professor Graham Bell read a paper on the photophone, Dr. Siemens exhibited a piece of apparatus which he called a "sensitive eye." This consisted of a lens which focussed a beam of light falling on it on to a peculiar arrangement of fine wires separated by a thin layer of selenium. The object of the arrangement of wires was to reduce the resistance to the electric current, which was passed through the selenium as much as possible. The apparatus had been constructed some years ago, and was intended for a photometer, but Dr. Siemens found an objection to it, in that, as he expressed it, it soon "fatigued," so that after using a short time, a ray of light of a certain intensity deflected the galvanometer needle to a less extent than at first. The sensitiveness was recovered on leaving the apparatus in the dark.

If M. Leon Vidal has overcome this difficulty, he should be in a fair way to success.—I am sir, yours, &c.,

W. K. Burton.

ALUM AND HYPOSULPHITE.

Dear Sir,—After reading Captain Abney's remarks on hyposulphite, I resolved to try an experiment, the details of which I give, and the result I send you.

I took the first negative that came to hand, and printed it by such light as a dull December would give I then washed, toned, and fixed the print in the usual manner; and after this the experiment began. Having given the print a good preliminary rinse, to get rid of the surface salt, I cut it in two, and placed the one part to wash, as usual. The other portion I plunged into a strong, freshly-made solution of alum, and left it there for half an hour, after which, having well rinsed it, to get rid of the alum, I gave it a bath for a few minutes in a saturated solution of carbonate of soda, rinsed it once more, and set it to dry between blotting-paper, going on with the washing of the other portion as usual. I am well satisfied that the whites of the alumned print are more brilliant, and the tone greatly improved—as you will see—and, in future, this is the course I shall pursue, and get rid of the endless washings. I recommend photgraphers to try a similar experiment, and note the results.—I am, yours faithfully,

James Watkins, L.C.P.

PLATINOTYPE PRINTING.

Dear Sir,—As a carbon printer of some years' standing, I may mention that experience in the production of pigment pictures stands one in good stead in platinotype printing. I find, practically, that the sensitiveness of the prepared films is, in both cases, very nearly the same, and that the number of tints (by photometer) ascribed to a negative, does either for carbon or platinotype. It is true that in platinotype printing you can judge, to some extent, of the printing, by inspection; but I think carbon printers who take up the process will find their old experience a much surer test of the work.—Faithfully yours,

Woolwich, 15th Dec. Robert Vincent.

MOON-LIGHT PHOTOGRAPHY.

Dear Sir,—In your issue of the 10th we notice the report of a paper read before the Edinboro' Photographic Sociey, by Mr. C. J. Burton, in which that gentleman refers to some experiments he had made in photography by moon-light. After describing the results he obtained with 300,000 or 400,000 times the exposure requisite by day-light, he says, "there are two others. I do not remember the exposure I gave to one of them, but the other got about 3,000,000 times as long as it would have taken at midday in summer." Now, taking it on supposition that half-a-second would suffice, with a good lens, to give a fully-exposed negative at mid-day in summer, then, according to calculation, the moon-light negative shown by Mr. Burton, had one 416 hours' exposure. How is this possible, Mr. Editor? The moon does not give such a continuous light in this part of the country, and we cannot conceive how such an exposure could be effected. Perhaps Mr. Burton will kindly explain, for we presume there is some error in the figures, of, at least, a few hundred thousands. As we have done a little in moon-light photography, lately, we may just add that upon a rapid gelatine plate, with a French lens—open aperture—we have obtained a view of a house by moon-light, in half-an-hour (1,800 seconds), with details not only in the lights, but also in the shadows. Indeed, we consider it so good an example of moon-light photography, that we intend publishing it on the 1st of January; and, being naturally interested in the experiences of others, we should very much like to know what was the real amount of exposure given to that negative of Mr. Burton.—We are, dear sir, yours faithfully, D. H. Cussons and Co.

Proceedings of Societies.

Photographic Society of Great Britain.

This Society held its monthly meeting on Monday, at 5a, Pall Mall East, J. Glaisher, Esq., F.R.S., in the chair.

The following members were elected:—Mr. Hugh Watson, Capt. Turton, W. A. Pringle, W. H. W. Jackson, E. H. Gould, and A. Debenham.

The report of the Paget Prize Committee was read by Mr. S. Davis. The competitors were four in number. The specimens sent in did not reach a high standard of excellence, and the committee, in awarding the prize, had simply adhered to the conditions laid down by Mr. Paget, and had not attempted any comparison with any process which had already been published. The prize was unanimously awarded to Mr. W. J. Wilson, Westwick Gardens, Hammersmith.

Lieut. Darwin then read a description of Mr. Wilson's process, and a print from one of the negatives sent in was shown by Mr. Valentine Blanchard.

The President, after reading a letter from Mr. Paget, containing a cheque for £50, handed the latter to Mr. Wilson.

Lieut. Darwin read a paper by Mr. Thorpe, F.R.S., on "A Simple and Expeditious Method of Preparing Pyrogallol for Dry-plate Development." Mr. Thorpe claimed for his method economy and excellence, and recommended photographers to manufacture their own pyrogallol, rather than to buy it.

Capt. Abney read a paper on "The Use of Iodide and Ammonia in Gelatine Emulsion." Captain Abney maintained, in contradiction to Dr. Eder, that the use of iodide did not detract from the sensitiveness nor the keeping qualities of the plates, while it did not give red or green fog as had been stated. He also claimed for the use of iodide the advantage of being able to work without the extreme gloom necessary for bromide alone,

Mr. England subsequently showed some prints from bromo-iodide emulsion plates. These had been kept for a considerable time before exposure and previous to development. He could see no deterioration arising from the use of iodide.

Capt. Abney then exhibited and explained a new sunshine recorder.

The President thought Capt. Abney's invention a valuable one, since Campbell's sunshine recorder was imperfect.

Professor Stokes, while not entirely agreeing with the President as to the imperfections of Campbell's recorder, believed that Capt. Abney's instrument would be very useful, though, not being himself a practical photographer, he might attach more difficulties to its use than really existed.

Capt. Abney explained that the sensitized paper used in his "recorder" was that prepared by the cyanotype process, and only needed washing to fix the image.

The President stated that the discussion on "Gelatine Emulsion" would be adjourned until the next meeting. The election of officers would also then take place.

The proceedings then terminated.

Edinburgh Photographic Society.

The first popular meeting this session of this Society was held in Queen Street Hall, on Wednesday, the 8th inst., the President, Mr. Lessels, occupying the chair. There was a very large attendance, the Hall being quite filled in every part.

The subject for the evening's entertainment was a collection of slides of Pompeii and Herculaneum.

Mr. Cox, of Gorgy, read a most interesting paper on the subject, giving a slight sketch of the history of the buried cities. He described very vividly the cause of their destruction; he also gave various experiences of his own while travelling there. Unfortunately, owing to other engagements, he was obliged to leave before the slides were exhibited, but a good substitute was at hand in the person of Mr. W. H. Davis, who described the different objects of interest as they were thrown upon the screen.

A vote of thanks to the lecturer terminated the proceedings.

Glasgow Photographic Association.

A general meeting was held in the Religious Institution Rooms on the 19th inst., Mr. John Urie, President, in the chair. There was a large attendance.

The minutes of the last meeting having been approved of, the following gentlemen were elected as members, viz.:—Messrs. Montague Paterson, W. B. Malcolm, Jas. Caldwell, D. Robertson, George J. Brown, E. Macwhannel, and E. Lennie-Alexander.

The following gentlemen were admitted as subscribers, viz.:—Messrs. John Coutts, Matthew Kennedy, and Thomas Dunbar.

The meeting, on the recommendation of the Council, unanimously appointed the following three gentlemen to act as Judges in the Competition--two being a *quorum*, viz.: Messrs. Walter Macfarlane, Andrew McTear, and J. G. Tunny.

The Secretary stated that he had had a second interview with Mr. Long in regard to the Competition for Transparencies, with the following results:—

1. That the gold medal was to be given for the dozen best transparencies for the lantern.

2. That the negatives were to be produced, but they could be either dry or wet plates.

3. That the winner was to present a set of prints of the negatives to the Association.

4. That the locality of the subject was confined to Great Britain and Ireland, and that the transparencies could be anything but portraiture or a composition picture; *i.e.*, must be taken direct from the negative, and the negative to be a simple picture direct from the camera.

5. That in order to afford amateurs and others who had not cultivated this branch of the art an opportunity of being able to compete advantageously, the time for competition would be extended to 1st July, 1882.

6. That Mr. Long dispensed with requiring the winner to divulge his formula, as he did not think the prize would be an adequate consideration for his doing so.

7. That the Competition was open to the whole Association.

As mentioned at the previous Council meeting, the Secretary intimated his intention to offer a silver medal to be given as a second prize in the competition for transparencies.

The President announced that the Exhibition of Competition and other pictures would be held in the Religious Institution Rooms on Wednesday, 15th inst., from 7·30 p.m. till 10 p.m., and on Thursday, 16th inst., from 10 a.m. till 10 p.m., and informed the meeting that the judges would be entertained to dinner on Wednesday, and invited the members generally to attend.

The Treasurer produced a negative which, when taken and intensified by bichloride of mercury, produced a good print; but six months afterwards became so flat that a satisfactory print could not be obtained.

Mr. McLellan expressed his opinion that the ammonia had evaporated, and

Mr. Leask suggested that the mercury being a solid body, and the ammonia a volatile body, the ammonia had evaporated, and a reaction of mercury had taken place, and that if the negative were again brought under the fumes of ammonia, it would return to its original state.

The Secretary drew attention to a misunderstanding among competitors as to the right of pictures intended exclusively for amateur competitions to compete in the General Competition, a number of members having the impression that the General Competition was confined to the professional members, but such, on referring to the Regulations, was found not to be the case.

After considerable discussion, it was resolved, on the motion of Mr. Leask, seconded by the Secretary, "That if an amateur gain a prize in the General Competition, he be excluded from taking the same class of prize in the Amateur Competition."

Presentation prints were distributed to a considerable number of the members whose subscriptions were paid, and the meeting thereafter closed.

Sheffield Photographic Society.

The usual monthly meeting of this Society was held at the Freemason's Hall, Surrey Street, on Tuesday evening, December 7th. The President, Thos. H. Morton, M.D., took the chair. There was a good attendance of members.

After the minutes of the preceding meeting had been read and confirmed,

Mr. J. Taylor, Hon. Sec., gave a description of the method of printing carbon transparencies, and then made a few transfers from prepared and exposed tissue in the ordinary manner. Mr. Taylor also exhibited some excellent lantern slides by the same process, and a portable tripod he had recently constructed with a folding top.

Mr. Yates brought before the meeting Hunter and Sand's instantaneous shutter, and photographs taken with it, also a washing trough for gelatine plates manufactured by Marion and Co.

Mr. Collinson showed a new form of clip, and several prints of local interest.

A discussion on the merits of the exhibits took place.

The President asked, as regards the shutter, whether the angular form the aperture assumed on opening and closing would affect prejudicially the result, also if vibration occurred on drawing down the curtain.

Mr. Stringfellow was of opinion that the exposure was too rapid for any ill effects.

The members generally thought it an extremely ingenious shutter. The washing trough was considered well adapted for the purpose.

The President (Dr. Morton) read a paper entitled "The Photographic Image—What it is" (in our next).

A short discussion followed.

On the proposition of the Vice-President (Mr. Collinson), seconded by Mr. Councillor F. Firth, a vote of thanks was unanimously given to the President for his address.

Thanks were accorded to Mr. Taylor for his remarks on the carbon process, and Mr. Yates for his contributions.

The meeting shortly after dispersed.

BOLTON PHOTOGRAPHIC SOCIETY.

THE December meeting of this Society was held on Thursday evening, the 2nd inst., Mr. W. PARKINSON in the chair.

The evening was occupied by a lantern exhibition, under the management of Mr. W. Bauks, who exhibited a number of slides prepared by Messrs. Daltou, Tonge, Taylor, and several other members of the Society, together with a series of views of the principal English cathedrals, &c.

To Correspondents.

F. R. W.—1. Warm a porcelain dish by rinsing it out with hot water, and then wipe it dry. Place your negative in the dish and pour on enough methylated spirit to cover it; after which, lay a sheet of glass over the dish to prevent evaporation. In a few minutes the varnish will be perfectly dissolved, especially if the dish be rocked from time to time. The negative must be then well rinsed with methylated spirit, in order to wash away all traces of the resinous matter, after which you may proceed as you suggest. 2. A saturated solution.

J. B. VENTNOR.—Gelatiuo-bromide plates do not, as a rule, yield trausparencies having a tone very suitable for the lantern. A long soakiug in a saturated solution of alum, however, somewhat improves the colour, or you may tono your pictures by means of tho acetate of soda and gold bath ordinarily mado use of for paper proofs. We cannot recommend special makes of plates—both those you mention are cousidered good brands.

R. WHITE.—It is highly probable that you have not been sufficiently careful in excluding external light; try again.

J. GLAVER.—1. Surely you must intend your question as a joke! What mortal man can tell you how much ammonia to put in your developer when no conditions of working are specified? Consult somo book or article on the subject. 2. One-and-a-half to two drams may be taken as a general average. 3. The sensitiveness of the plate would be the same in each case. 4. In the case of a highly-salted paper an eighty or ninety-grain bath should bo used, especially when the negatives are rather dense; but many of the papers sold at the present timo are better adapted for a weak bath—say forty to fifty grains. 5. No.

A PHOTOGRAPHER IN THE DARK.—1. Over-exposure is undoubtedly the cause of your troubles. Try tho effect of reducing it to one-sixth. 2. If you undertake it you must be prepared to devote a considerable amount of attention to the work, or you will not be successful. It is a process which will not serve to fill up spare and occasional half-hours.

HYPO.—They thoroughly decompose each other, and any attempt to obtain tho effect of both simultaneously will prove futile.

LITHO.—You will find what you require in our YEAR-BOOK, which will now be issued in the course of a few days.

BROMO-IODIDE.—1. This action is peculiar to a small number of substances. 2. No difference in composition has hitherto been detected, the variation between tho two forms being purely moleclular.

HISTORICUS.—The pictures referred to are not photographs, and as portraits are hardly worthy of serious notico.

L. ESLAND.—The alum bath may be either prepared with common alum (this being a double sulphate of aluminium and potassium, or of aluminium and ammonium), or with the simple sulphate of aluminium. This latter salt has some advantages, aud is more economical in use.

OSCAR M——.—Few substances, if any, are entirely unaffected by light, although our means of recognising tho work of this potent ageut are often insufficient to enable us to trace the action. When the colour of glass has been altered by exposure to light, the original tint is usually restored by heating the glass to a low red heat, or a temperaturo just below its melting point. It is scarcely necessary to say that lenses should not be subjected to this ordeal of fire.

H. BULD.—Mr. Warnerke has shown some very fino casts mado by means of tho so-called Spence's metal; this material being practically sulphur containing a small proportion of somo metallic sulphide.

IRONBRIDGE.—The lens first mentioned will serve best in cases where the camera can be planted at a convenient distance from the object; but local circumstances will often render it advisablo to make use of No. 3. If, however, you wish to secure views in very confined situations, you had better employ the second lens you refer to. It will cover a 12 by 10 plate well, provided that the smallest stop is used; and the back combination, used with the stops as fixed, will serve as a landscape lens. If the lens is of recent mako, you will probably find that the back combination has a focus of about 15½ inches.

NOVICE (Weybrigde).—Unless you wish to waste collodion, soil plates, and lose your temper, you had better make fresh baths. Reduce the silver from the old ones, or send them to a refiner.

VFLOX.—Any hand-book of Physics will give you the information, but do not draw any conclusions until you have fairly studied the matter, or you may waste some money and a great deal of time.

CARBON.—You have dried your tissue too rapidly. Adjust the temperature of the room so that the tissue requires ten or twelve hours to dry, and take care that the water in which you soften the tissue, previously to squeegeeing on the collodionized glass, is as cold as you can conveniently obtain it.

L. M. R.—1. About four years ago. 2. We will make enquiries.

W. J. N.—Daylight, undoubtedly, is by far the best and cheapest; but if you are so unfortunately situated that you can get no opportunity of working by daylight, make use of a pyrotechnical light. See our YEAR-BOOK for 1879.

WINCH BROS.—Reigate.

IGNORAMUS.—1. Any thin, hard paper, slightly varnished, will answer. 2. You must employ a much thicker tissue than that ordinarily used for carbon prints. No licence is required, provided you only work the process experimentally; but you must not derive profit therefrom in any way. Ordinary carbon tissue is sold in a sensitive condition by the Autotype Company, but it is generally better to sensitise for oneself, unless large quantities are used.

R. POOLE.—You have been misinformed, as a solution of ferrous sulphate cannot be evaporated to dryness without a change taking place; at any rate, unless the access of air be prevented, basic ferric salt is deposited when oxygen is absorbed, and the weight of tho residue obtained by evaporating the solution would teach you little as to the original proportion of crystallized salt contained in the solution.

J. C. (Warrington.)—The subject is one of great interest, and two articles bearing on it will be found in the YEAR-BOOK for 1881.

J. LILDERT.—1. In all probability, some other cause led to your failure. 2. In favourable weather, we should say at least a week, and often much longer, especially if potassium bromide has been used in its preparation—potassium nitrate being a powerful antiseptic. 3. A friend of ours, who advocates this proceeding, assures us that the emulsion will keep a hundred years. The only way we can suggest of determining the matter is to try the experiment.

JOHN SMITH.—1. You can preparo the salt as you suggest, but you must wash and dry it in the dark. 2. The platinotype process is certainly gaining ground. See our "At Home" in last week's number. 3. The last edition of "Fownes" (2 vols), or Miller's Handbook (3 vols).

ARGENT.—You can get it melted for you in Clerkenwell while you wait; and a pint of beer has been frequently found to exercise a powerful catalytic action in hastening the result.

T. W.—There are still a few copies left of the Emulsion book; Abney's "Instruction" can be sent you by our Publishers, by post, 2s. 8½d.

The Photographic News, December 24, 1880.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Gelatine Bromide Tissue—Goupil's Photogravure—Preparing Gelatine Plates in the Studio.

Gelatine Bromide Tissue.—We have read several accounts of trials to make flexible gelatine pellicles in the style of Warnerke's emulsion films. It would be indeed very important to have such a tissue, which would make the practice of photography much less burdensome to travellers. We have obtained good results with Warnerke's collodio-emulsion films, but, for some reason, this ingenious product has not come into general use. Although the preparation of the collodio-bromide tissue is probably a difficult matter, it is our opinion that the preparation of gelatine bromide paper should be much easier. Everybody knows how carbon paper is prepared, a sheet of paper being drawn over the surface of a warm gelatine solution containing pigment; exactly in the same manner a band of paper could be coated with a gelatine solution containing bromide of silver. Warnerke gave his paper preliminary coatings of india-rubber and plain collodion, and perhaps a similar preparation would be necessary for the gelatine bromide tissue. Warnerke removes the film from the paper after development, and mounts it on glass; but it might be more convenient to let it dry on the paper, and then to render it transparent by means of wax or a suitable varnish. Perhaps such tissue would become of very high importance for making positive prints on a large scale by means of artificial light. We mention here that on one occasion we wished to reproduce fifty copies of an astronomical photograph, and, as no daylight was available, performed the printing operations by gaslight—commercial gelatine plates being employed—the exposure, at seven inches distance, about eight seconds, being eight seconds at a distance of seven inches from the flame. In this way we produced fifty pictures in about one hour, and no doubt it could be done in a much shorter time, provided that convenient arrangements were at hand. But although we say one hour, we must confess that fixing was not included. Why is the time required for fixing gelatine plates of commerce so widely different? We have obtained plates which were fixed in five to six minutes, and other plates from the same manufactory needed at least half-an-hour for perfect fixation. Such plates could be fixed much more rapidly by means of cyanide, but sometimes we lost a plate because the alkaline fixing solution dissolved the gelatinous film.

Goupil's Photogravure.—The process of photogravure worked out after the Woodbury idea in Goupil's celebrated establishment with admirable success has induced many to offer suggestions as to the best manner of obtaining a grain gelatine relief. Certainly Major Waterhouse's researches, as described in the Photographic Society's Journal, are very valuable, but it is doubtful whether his method is identical with M. Rousselon's. All artists acknowledged M. Goupil's photogravure as the most artistic photo-mechanical process of the day, and we must add, it is a cheap one. We have purchased a photogravure, after a landscape painting of Lier (size of the picture 24 by 18 inches), for £1, whilst we have paid more than double the sum for a silver print of the same size. Would it not be possible to obtain the same results, especially with the co-operation of Mr. Woodbury, the original inventor? Indeed, Goupil has spent many thousand pounds in working out the process, and in making it really practical, while perhaps any other person who would wish to do the same would have to expend a like amount. But it seems clear that the result can be obtained by others, as we have before us some pictures of Makart, the celebrated Austrian painter, reproduced by a photo-mechanical process of Mr. Klic, engraved in Vienna. The reproductions are so similar to Goupil's photogravures that they might be confounded with each other. We know that M. Goupil employs the electrolytic method for reproducing his photo-reliefs in copper, and he requires about four weeks for the deposition of the necessary thickness; but Klic, we are informed, only wants three days for making a copper plate from a negative.

Preparing Gelatine Plates in the Studio.—We have recently had an opportunity of conversing with M. Mottu, of Amsterdam, who is one of the best known continental makers of gelatino-bromide plates, and this gentleman expressed the opinion that, after two or three years, every photographer will prepare his own gelatine plates. We cannot agree with this opinion, as all know how very easy it is to make albumen paper—easier, certainly, than to prepare gelatine plates. Yet only a few photographers, and the owners of very large establishments, make their own albumen paper. How few photographers possess really suitable rooms for the preparation of dry plates? How few can find time for watching over the process, and for making the emulsion? The process may be easily worked out in the winter time, but in hot summer months the whole aspect of affair changes, and a period of trouble sets in, enough to drive the already over-worked photographer out of his senses. We are informed that last summer almost all of our gelatine plate makers were compelled to work during the night, because the temperature during the daytime was so high as to cause constant difficulties to arise. The troubles incident to developing and fixing gelatine plates in hot weather are sufficient to exhaust the patience of the average mortal, but in working with Dr. Vogel's emulsion we are informed that these troubles are eliminated. Until, however, more is known of this preparation, we must withhold our final judgment. Why is it not yet introduced into England? In France it is manufactured by M. Schaffner, of Paris. Our excellent confrère and correspondent refers to the matter in his interesting Paris letter of December 10: "We are surprised to find no one has given an authoritative opinion on the new product." We beg to call attention to the fact that a first-rate man like Dr. Eder has given a very favourable report on the subject in the July issue of the *Photographische Correspondenz.* We hope soon to hear more on the matter.

At Home.

AT THE OPENING OF THE BRISTOL INTERNATIONAL EXHIBITION.

Tom Hood once remarked that anybody could write like Shakespeare if he had a mind to, but that, unfortunately, the mind was generally lacking; and it might be said with equal truth that any Society could readily get together an exhibition as fine and complete as that now to be seen at Bristol, if it only had the Secretary to do it. For there cannot be a doubt that to Mr. H. A. H. Daniel, the Honorary Secretary of the Bristol and West of England Amateur Photographic Association, is due, in the main, the credit of having gathered together an Exhibition that ranks not only as one of the finest in this country, but in the whole world. When we mention that there are in the catalogue no less than 730 exhibits described, of which many are frames containing several prints, and that the gathering comprises not only the best pictures exhibited this year in London, but also for some years previously, we need not say another word to intimate the magnificence of the collection.

The rooms in which the Exhibition is held—the galleries of the Fine Art Academy—are, moreover, worthy of the display they contain. A fine and spacious central hall contains the landscapes, interiors, out-door studies, &c., while other rooms on the right and left are devoted to portraiture, ceramics, transparencies, apparatus, &c. On

Friday night these were well filled with a gay and brilliant company—the *élite* of Bristol and Clifton—to witness the opening ceremony, conducted by the Mayor of the city, in his crimson robe of office, assisted by other civic dignitaries. Colonel Biggs, who has recently been elected President of the Association, opened the proceedings by welcoming the company to the Exhibition, which he believed to be second to none previously held, and then the Mayor made his speech declaring the Exhibition open. The Mayor's words were forcible and to the point. Both in palace and in cottage was photography welcome, he said; it was an art by which the rich and poor alike benefitted—so much so, indeed, that it had become a necessity. The photographic album was a household treasure, containing, as it did, the likenesses of living friends, and the shadows of dear ones who had passed away. Photography, too, gave us transcripts of the fairest scenes on earth, and reproduced the masterpieces of our great painters. Valuing photography for these and other reasons, the Mayor hailed with pleasure the efforts of those who had laboured to get together the Bristol Exhibition, which could not fail to have an influence in stimulating and perfecting art.

The names of the judges appointed to make the medal awards are already known. They were:—Messrs. J. Jackson Curnock, W. H. Midwinter, Payne Jennings, W. Radcliffe, and Henry Whatcly. The decision of these gentlemen was made known at the opening ceremony, and we may at once mention the names of the happy few. The gold medal of the Association—the grand prize—is awarded to Mr. Augustus W. Wilson, for his well-known pictures, "The Seven Ages of Man." The prints shown are enlargements in carbon, illustrating Shakespeare's familiar lines, and depicting man from youth to old age. The work is an ambitious one, and Mr. Wilson deserves every credit for the pluck and perseverance he has shown in combating, and combating so successfully, with a subject beset with difficulty. That he has not secured victory on all points—the "Lover," for example, is a weak, sallow-faced young man, with worn and weary features—was not to be expected; but the award of the gold medal will show that the judges appreciated Mr. Wilson's efforts in a manner that cannot fail to be very flattering to him, since they stamp his work as that possessing "the highest degree of merit."

Eight silver medals in all were awarded. Mr. J. Gale secured one with his familiar picture, "Brixham Trawlers"; another went to Mr. Harvey Barton, for his magnificent Bristol scenes; a third to Mr. Robert Faulkner, for his studies of child life; yet another to Mr. H. S. Mendelssohn, of Newcastle-upon-Tyne, for portrait studies; also a silver medal to Mr. H. P. Robinson, of Tunbridge Wells, for his fine picture "When the day's work is done"; a silver medal to the Woodburytype Company, for their magnificent enlargements; a silver medal of progress to the Platinotype Company; and last, though not least, a silver medal to Mr. W. B. Woodbury, for his improved and simplified method of producing photo-relief prints. Thus, in all, eight medals are given for work already familiar to our readers.

The bronze medals awarded were fourteen in number. Mr. William Bedford and Captain Abney received them for landscapes, and so also did Mr. H. A. H. Daniel and the School of Military Engineering. Mr. J. M. Young, and M. B. Czechowsky, of Odessa, gained medals for portraiture. Mr. Adam Diston received an award for his genre pictures, Colonel Stuart Wortley for transparencies, Mr. G. Hare for an improved camera and changing box, Messrs. W. W. Rouch and Co. for a tourist camera of excellent design and workmanship, Mr. Geo. F. Williams for instantaneous pictures, and also Messrs. Hunter and Sands for similar productions; Mr. George Nesbit a bronze medal for the "Broken Leg," and Mr. T. G. Whaite one for his drawing-room and beach pictures. Thus, with but one or two exceptions, the medals were all awarded to exhibits that have already been seen elsewhere.

One of the finest collections of pictures is that of Mr. Harvey Barton, a photographer of whom Bristol may well be proud. His magnificent work was duly appreciated this year at Pall Mall, but he shows here a yet more extensive series. An interior of "Berkeley Chapel," among others, may be cited as a delightful picture, and to mention a second that cannot fail to secure universal admiration, there is No. 8, a masted craft with flapping sails coming into harbour, having all the qualities of an exquisite painting, and none of the shortcomings of photography. The fair city of Bristol (12) is represented by a marvellous photograph, 42 inches in length, the atmosphere so clear and bright that the handsome churches and spires for which Bristol is justly celebrated stand out with vivid distinctness. St. Mary Redcliffe and St. Stephen's, and a hundred and one other spires, may be counted in this fine picture.

Mr. Harvey Barton also shows an excellent view of Bath, of the same dimensions. Next to Mr. Barton's collection are some Brittany landscapes by Major R. Gordon; the quaint architecture of Guingamp (25) receives excellent treatment at the hands of Major Gordon, who has also been successful in producing a good picture of Mont St. Michel (24). Mr. F. Trueman (44, &c.), sends some forest sketches from the neighbourhood of Balmoral and Braemar, pictures of deep-shadowed fir plantations that interpret well the Scotch woodland, but would have been all the better if they had not been quite so dark. Of Mr. John Terras' pictures, we prefer "Sleepers" (51B), mother and child asleep. Mr. Edward Brightman, the Treasurer of the Association, is represented by several fine landscapes, some of which, unfortunately, are hung too high for inspection. East Lynn (54), with its tufts of ferns, its delicate undergrowth, silvery brooklet, and shadowy foliage, is our favourite. The Autotype Company forward some of Mr. Thomson's magnificent China series, many of which were exhibited at Pall Mall this year. The pictures of the School of Military Engineering are also known; it is well represented here, the Glen (56), printed in platinotype, being one of the best pictures. Miss Miles (57 and 611), one of the lady amateurs of Bristol, exhibits an excellent interior, and also a "pony tandem," a picture exhibiting considerable tact and good taste. The Platinotype Company and Messrs. Hunter and Sands both show largely, but the pictures are mostly the same as those exhibited in Pall Mall this autumn. The same may be said of Mr. E. S. Baker and Mr. G. F. Williams. Mr. C. V. Shadbolt exhibits a series of train studies; we have the (71) L. C. D. R. cheap fast train, the S. E. R. Royal mail, the S. E. R. Continental mail express, the S. E. R. Whit Monday express, the S. E. R. ordinary express, &c., &c.; but after close study of them all, we must frankly admit our inability to distinguish between a cheap fast, a royal mail, a continental, a Whit Monday, or an ordinary express. However, we are quite ready to take Mr. Shadbolt's word for the "cheap fast," &c., and sincerely hope he may secure a large and appreciative public for his pictures. His series of landscapes, especially Stybarrow Crag, Ullswater (72), are much more to our taste. Mr. Matthew Whiting, who was absent this year from the Pall Mall Exhibition, also exhibits, among others, a very fine view of Stybarrow (78), together with some delightful peeps of the leafy country around Leatherhead. Mr. C. G. Cutchey is represented by "Studies in Epping Forest" (79), and a second frame of four pictures.

Of Mr. Beetham's pictures, which consist of transparencies and a frame of landscapes, we prefer "Tintern Abbey (83), a delightful view of the pile. Mr. Edwin Forehead's "Old Cedar, St. Lawrence" (85), with its spreading branches and massive shadows, is one of many good pictures. Mr. Andrew Pringle's high-class work we recently referred to on the occasion of the Pall Mall Exhibi-

tion, as also that of Messrs. Marsh Bros., who are represented by their famous swan studies, and other pictures of scarcely of less note. Mr. Baynham Jones has evidently not been idle lately; Lynmouth Harbour, with its picturesque sea wall and old fisher cottages (97), is a charming study; and another, "Old Gateway and Rectory House, Eversham" (328), a quaint relic of bygone days, is well worthy of their author; Mr. Gale's bijou series requires no further commendation on our part.

Mr. W. G. Coote exhibits "Pembroke Castle" (110); the old boats in the foreground are composed and limned with much taste, and form a vigorous contrast to the grey old castle opposite. Colonel Biggs, the President of the Society, makes good his position by an excellent display of Indian views, some of them treated in most masterly fashion. "The Idol-car, Bunsunkuree" (113), is one of the boldest of the series, while the "Ruins of Berjapoor" (119) will also find many admirers. Messrs. Day and Son show many of the good pictures they have shown before, together with one or two novelties, if we mistake not.

We now come to two names who have much to do with the success of the Exhibition, since they are those of gentlemen of high standing who have not previously exhibited this year. Bristol is, indeed, honoured by the magnificent collection of new pictures sent by Mr. William Bedford and Mr William England. What shall we say of "Guy's Tower, Warwick Castle (126), of Mr. Bedford? The sunlit trees, the rich foliage, the deep shadows, and the stately grey tower, make up a picture indeed. The sharp lines of the castle, rising from the placid moat, peep out between two leafy masses. Sang Mrs. Hemans—

> The stately homes of England,
> How beautiful they stand,
> Amidst their tall ancestral trees,
> O'er all the pleasant land.

One of the fairest scenes in all fair England is here, and, as you look and long, the sweet summer time comes back to you, the warm air is upon your cheek, and you can almost hear the hum of insects in the glowing sunshine. "Pont-y-pair" (127) is another summer scene of Mr. Bedford's, scarcely less enchanting.

Mr. England's pictures come from Switzerland. Look at the Pass of the Tête Noire (279). The pathway is but a narrow shelf cut in the rocky side of a steep mountain; as you stand here on the jutting prominence, the whole of the magnificent defile is before you—the pine-clad slopes—the lofty peaks towering to the clouds—the sheer precipices of cliff and crag. A clump of black firs in the foreground supply a contrast to the clear bright panorama beyond, and give a sense of the magnitude of the vast mountain ranges before you. Look, too, at the Matterhorn and the Riffel (285), two lofty pinnacles, the one a glitering spire of ice crystals—the other in the foreground a black pyramid that might be taken for the Matterhorn's shadow, it is so dark and gloomy. Mr. England has never shown a finer series of studies.

To be Continued.

The "At Home" next week will be "Mr. Harvey Barton at Bristol."

ABSTRACT OF DR. MORTON'S PAPER.*

It is quite possible that in the remarks I purpose making this evening in connection with the photographic a t I may mention topics and some details which are familiar to many present; but as chemistry and optical and physical phenomena enter largely into the theory and practice of photography, the field is so extensive that there is always something interesting and suggestive even in the rudiments, especially to those who are commencing their studies. Although this paper may be considered an introductory one, I don't wish to load it with any historical account, or describe the early methods of producing a light picture, but shall at once take for my subject the photographic image—what it is. And under this heading I must restrict myself to the collodion, silver, or wet process, leaving gelatine dry plates, collodio-chloride, platinum, carbontype, and the numerous other types which have sprung up in all directions, for future consideration. Now, in an ordinary pencil, pen-and-ink, or sepia sketch, we have a deposit of a dark non-reflecting substance which gives the outline of figure on a lighter background; the different gradation of shade is acquired by a more or less deposit of lead, ink, or sepia. In photography, at least in the ordinary silver process, the image is formed by a deposition of metallic silver or an organ c oxide in a minute state of division, either upon glass, paper, or other suitable material. This is brought about by the action of light and certain re-agents. Light has long been recognised as a motive power comparable with heat or electricity. Its action upon the skin, fading of colours, its effect on the growth of vegetable and animal organisms, are well known, and although the exact molecular change in many instances is not clearly understood, yet certain salts of silver, iron, the alkaline dichromates, and some organic materials, as bitumen and gelatine, have been pretty well worked out.

It is a remarkable and well-known fact, that the chloride, iodide, and bromide of silver, called sensitive salts in photography, are not susceptible, at least only slowly, to change when exposed to the yellow, orange, and red rays, the longer wave lengths of the spectrum which you know form, with violet, indigo, blue, and green, white light. The diagram on the wall shows this dispersion and separation of the primitive colours. The yellow, orange, and red, are called technically non-actinic rays, and the others in their order become more actinic until the ultra violet is reached. The action of white light or rays excluding yellow, orange, and red, has the effect of converting silver chloride into a sub-chloride; it drives off one equivalent of chlorine. The iodide of silver in like manner is changed into a sub-iodide, but in the presence of water hydroiodic acid is formed, unless an iodine absorbent be present.

It is important to bear this in mind, as one or other, frequently both iodide and bromide of silver, is the sensitive salt requisite or used in producing the invisible image.

The theory regarding these sensitive salts of silver is that, being very unstable—*i.e.*, ready to undergo a molecular change—the undulations produced in the ether which pervades all space by the potential action or moving power of light is sufficient to disturb their normal chemical composition. The undulations liberate some of the chlorine, iodine, or bromine as the case may be. This action of course applies to light from any source, the sun, electricity, or the brighter hydro-carbons, flame from gas or candle, whether it come direct as rays of white light, or be reflected from an object, and conducted through a lens as a distinct image upon the screen of a camera.

I have no time to speak on the subject of lenses, only just to mention that they are or ought to be achromatic, so as to transmit white light, and of perfect definition, and the amount of light passed through should be as much as possible consistent with a sharp image, at least when rapid exposure is attempted.

I shall touch very lightly on the manipulative part of photography, as that would be unnecessary; but a brief account of the chemicals in use is essential to a right appreciation of the theory of developing the image. In the first place, our object is to get a film of some suitable material coated with a thin layer of a sensitive salt of silver—say a bromo-iodide. By mixing certain proportions of ammonium iodide and cadmium bromide, or an iodide and bromide of cadmium, with collodion, which is pyroxyline, a kind of gun-cotton dissolved in ether and alcohol, a plate of glass is coated, and before being perfectly dry is immersed in the nitrate of silver bath. The silver nitrate solution, adhering and entering to a slight extent the surface of the collodion, becomes converted by an ordinary chemical action of affinity into silver iodide and bromide. The ammonium and cadmium play a secondary part in the process, and are not absolutely necessary in forming the image.

The plate is now extremely sensitive to light. When we have entered it into the dark slide and camera, and then exposed to light, the change I mentioned has taken place, and the film is transformed into different quantities of sub-iodide and sub-bromide of silver according to brilliancy of light. In addition, there is on the plate an amount of unchanged silver nitrate which comes in useful in the second stage, or development. The image is not seen as yet, being latent, and requires the well-known developing solution: sulphate of iron, acetic acid

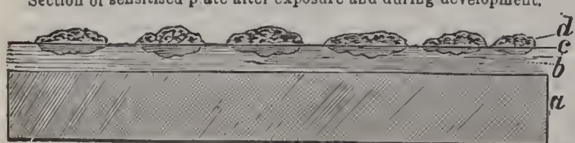
* Read before the Sheffield Photographic Society.

alcohol, and water. Practically, we all recognise the effect of a nicely-balanced wave of developer worked round a plate. The high lights are the first to appear as a darker colour, until the details of shadow come out; when this is reached, the developer is washed off. The chemical action is briefly thus, and it can be shown by reactions without a photographic plate, as in a test tube, thus:—Pour into this glass a solution of silver nitrate and add a solution of ferrous sulphate The ferrous sulphate combines with the nitric acid, forming two new salts, ferric nitrate and ferric sulphate; the silver is deposited; any other substance which will remove oxygen from the silver nitrate without combining with the silver would do the same, and metallic silver would be thrown down. The formula as shown on the diagram explains the interchange.

When the developer is poured over the plate it attacks first the free silver nitrate, and causes it to deposit extremely fine particles of metallic silver. The question arises, how is it that these particles arrange themselves to form an image? This is explained by the physical movement known as molecular attraction or affinity. These particles are attracted first to the portions of the plate where there is most sub-iodide and sub-bromide; in the shady parts, less silver is deposited. When the image is once started, it follows that particles of silver produced by the iron developer will cause more to fall down on the face of those already present, and the image is built up. Of course, if the silver nitrate is all consumed on the plate, the developer becomes useless or injurious. The presence of acetic acid checks the reduction of the silver, and the alcohol facilitates the flow. When the bath becomes charged with ether and spirit, the molecular attraction just mentioned is made plainer by reference to the simple lead tree experiment.

We have here in this bottle a piece of zinc rod introduced into a solution of acetate of lead. A chemical change has taken place. The zinc has abstracted the acetic acid, and the lead is deposited upon the zinc, and will continue to do so until the solution is exhausted. The irregularities of surface and arborescent appearance are well shown. If the change were rapidly conducted, the lead particles would, from their weight, sink directly to the bottom, instead of aggregating together like ordinary crystals. I have constructed a diagram of coloured

Section of sensitised plate after exposure and during development.



a. Section of glass plate—support.
b. Collodion film—substratum.
c. Sub-bromide and sub-iodide—gradation of.
d. Silver deposit—image.

card, which will, perhaps, more clearly demonstrate the relation of the different constituents. The lower portion, *a*, represents a section of the glass plate or support. The letter *b* points to the position of the collodion film, this having upon its surface a thin layer of bromo-iodised silver, which, when exposed to a well-lighted image, as in a camera, is changed into different gradations of sub-bromide and sub-iodide, as indicated by irregular dark masses in the film. The dotted marks immediately above these are intended for the silver deposit, clusters of granules being more abundant in the well-lighted, and less in the shaded parts of the picture, corresponding to the amount of sub-bromide and iodide beneath.

The next point to consider is that of intensification, a process seldom required in positive pictures, and would not be needed so often in negatives if there was enough free silver nitrate on the plate during development. The object, as we all know, in a wet plate negative is to get good printing density without destruction of half-tone. It is a rule, I believe, in an over-exposed picture, to intensify after fixing the image; in an under-exposed picture, to intensify before fixing; whichever it does, the intention is similar, viz., to intercept in a greater degree the light passing through a negative so as to make a whiter and cleaner print. The usual intensifier, and I suppose there is no better—pyrogallic acid, citric acid, water, and a few drops of silver nitrate solution. Pyrogallic is the most active agent, and might be used alone with water, but, for special reasons, is not desirable. As a chemical it has a great affinity for oxygen, and will precipitate silver from a solution, for instance, containing nitrate of silver. It also combines with the metal forming a pyrogallate, a dark brown very non-actinic material. Citric acid is the retarder in this case, and alcohol is unnecessary, as the film is well washed with water before intensifier is used, consequently it flows readily over the plate. As regards fixing—or, more properly, clearing the image—to the simple act of dissolving out or from the film all free nitrate, chloride, iodide, or bromide, which may be present, cyanide of potassium does not attack the metallic deposit, unless very strong; it has then a tendency to reduce the detail in the shadows.

FRENCH CORRESPONDENCE.

Selenium Photometer—New School for Photographic Assistants—The Vogel Emulsion—Balloon Photography—New Works on Photography.

The Selenium Photometer.—Since my last letter I have been carrying on my experiments with the object of constructing a selenium photometer for photographic and meteorological observations. As always happens in researches of this kind, one is obliged to make use of those instruments which can be bought, or found ready made, before arriving at the point of being able to make for oneself the apparatus which is necessary for the end in view. In the present instance there are three distinct elements which have to be considered: there is, first, the construction of the selenium receiver; next, the electric force and the method of producing it; and lastly, the most convenient form of galvanometer. As may well be supposed, all these give rise to investigations of great delicacy, and requiring a certain amount of patience; considerable time must also be allowed for the construction of new instruments, and for the necessary modifications in those which are at hand. The whole question, however, is such a very attractive one, that I have felt no hesitation in undertaking its solution, notwithstanding the difficulties to be overcome, and the cost, which in experiments of this kind is by no means small. In order to thoroughly exhaust the subject, and be in a position to meet all objections, it is also requisite to have a certain amount of practice in carrying out these experiments. It is not enough to have a single selenium receiver, since the trials must be made in such a way as to show how different receivers will, all things being equal, produce different effects which are comparable one with another. We have to take account of the "fatigue" from which the selenium suffers, and which Mr. Werner Siemens was the first to point out; this is the point to which Mr. W. K. Burton alludes in his letter published in the Photographic News of the 17th of December last. For this purpose, experiments must be made with two receivers, of which the one has had a long period of repose, while the other has been submitted to the action of light for a considerable length of time. The duration of the luminous action must also be made to vary, so as to arrive at the degree of permanence of a similar effect in the exposed receiver. In short, it will be necessary to enter upon a continuous course of work, of which I can only here give a rapid outline, but which it will take me some months to complete. Now, although I have at the present time plenty of other work on hand, I am full of hope, as my first essays lead me to expect that I shall succeed in making a photographic photometer of extreme sensitiveness. I cannot as yet pronounce an opinion as to the possibility of using the same photometer for meteorological purposes. For the latter application I ought to be sure of the permanence of the proportional action of the instrument under successive variations of the luminous intensity, extending over weeks or even months; this I have not yet been able to establish. What I have observed up to the present is nothing more than what others have determined before me, for I have confined myself to repeating experiments which are known. My plan of

proceeding has been as follows: the receiver is a plain surface constructed in the same way as that described by Mr. Graham Bell; it was placed in the circuit of an electrical current of feeble intensity, produced by a couple of Daniell cells, or even by a portable medical electro-galvanic apparatus. The galvanometer is divided into *milli-weber*, or units of intensity; it has an astatic needle, and is one of the ordinary instruments sold in shops. So soon as the circuit was established, the receiver was covered with a screen, and the galvanometer arranged in such a way that the needle pointed to zero. On uncovering the receiver, there was immediately produced a deviation of the needle—one which varied, proportionally to the intensity of the light, between one unit and three units of intensity, according as the sun was more or less clouded with a strong sunlight; the deviations seemed to me to extend to four units. If now the screen be again placed on the surface of the receiver, the needle returns immediately to zero. If one or more sheets of tracing paper be superposed, their presence will be at once marked by weak but very perceptible movements of the needle towards zero. This is so evident that a person placed in another room, where he can see the galvanometer only, is able to count the number of pieces of semi-transparent paper as they are placed successively over the receiver. Again, if the receiver be taken in the hand, and approached nearer to the window or removed from it, the needle will be observed to deviate more and more from zero as the receiver is nearer to the light, and to return gradually to zero as it is drawn back again. For half-an-hour, during which I observed the instrument, the sun was shining with a rather dull light, and alternately veiled by clouds. With my eye on the needle I was able to read very clearly all the variations. In making these observations I was furnished, as I have already stated, merely with an ordinary galvanometer, but I am shortly going to have one made expressly for this investigation, and then I shall be able to give a set of figures which can be compared one with another for even the slightest variations. I have also repeated the observations of Werner Siemens, Adams, De Paiva, and others, that if there be interposed screens of different colours—red, yellow, green, blue, violet—the luminous action has always visibly the same intensity. A very slight tendency to return to zero seems to be due to a little darkening produced by the interposition of the screen, rather than to the nature of its colour. According to this, the photometer would not be able to measure difference in the luminous influence on sensitive substances, since, while under an orange-yellow glass, a sensitive film would be very slightly, or not at all, acted on. The action on the selenium is, in reality, very nearly equal to that of white light. In fact, the following are the results of the action of light of the different colours of the spectrum on the selenium, as measured by the photometer:—

Colours.	Deviations.
Ultra-violet	... 139
Violet	... 148
Blue	... 158
Yellow	... 178
Red	... 188
Ultra-red	... 180

According to this table, the least action is produced on the selenium by those rays which have the greatest influence on sensitive photographic substances, and the red rays, which are so inert in acting on photographic substances, produce the greatest effect on the selenium. Thus, in practice, these differences, which can be perceived with only the greatest difficulty by means of instruments of relative precision, run one into the other, and we arrive at results which are almost identical. As regards the "fatigue" of the receiver, I have not been able to observe this phenomenon. The method of its construction has on this point a very great importance. The surface of the sensitive metalloid ought to be of considerable area, compared with its thickness. Hence, if any change takes place in its mass, it is capable of being immediately reconstituted. But here we come upon experiments which require a long time for their confirmation, and I shall not be for some months in a position to make any precise statement on this head. For observations which extend over only a short space of time, the following is the method of operating. A current is set up. The receiver under cover is introduced into the circuit, and the galvanometer is arranged so that the needle is over zero; the receiver is then uncovered, and the deviation produced is noted; this indicates the intensity of light at that particular moment. The current is now interrupted, and the needle returns rapidly to zero, when, the receiver being covered, a fresh experiment may be immediately entered upon. The "fatigue," which is indicated by a slow recovery of the needle, is less in proportion as the light is stronger; but there ought to be some method of correcting this slowness. Enough, however, on this question for the present, although it is so interesting a one that I should have a great deal more to say on the subject if I did not recollect that I have already almost reached the limit of my letter.

Project for Establishing in Paris a School for Photographic Assistants.—The idea in favour of establishing a system of technical instruction in photography is making its way. At the last meeting of the *Chambre Syndicale de la Photographie* a proposal of this kind was made, and the question was referred to a special committee. The intention is to give this instruction, and to offer diplomas to the pupils who succeed in passing an examination. There is no doubt that by this means we may be able to obtain valuable results; the difficulty of finding able and skilful operators being now very great.

Dr. Vogel's Emulsion.—Several photographers have been trying the new emulsion invented by Dr. Vogel, and have obtained very satisfactory results. The preparation of the plates is extremely easy, and their desiccation, especially, is very rapid, whether it be after the first preparation, or after washing. Its sensitiveness is, as I have already said, less than that of an emulsion of gelatine alone. Nevertheless, it offers such very great advantages, that it promises to take an important place among photographic substances.

Photography in a Balloon.—Messrs. Cayol Brothers, of Marseilles, have recently been successful in taking photographic pictures from a balloon. They used for this purpose gelatino-bromide plates by Van Monckhoven.

New Works on Photography.—Two new photographic works have just been published by Gauthier-Villars. The first of these is a French edition of a book which first appeared in England—a practical treatise on the retouching of photographs, together with a highly-detailed description of a method of enamelling, and formulæ of several other processes, by Monsieur Piquepè.* The other is entitled "Dry-plate Photography: Pyroxyline Emulsion in the Silver Bath," by Monsieur C. Fabre, of Toulouse. Although gelatino-bromide is now all the fashion, we can still admire this fidelity to collodion. Certainly this substance ought not to be abandoned, for we have ample proof that its sensitiveness will soon be so improved as to be equal to that of gelatine plates, and we shall finish by returning to our first love again. Monsieur Fabre is so conscientious an experimenter, that no one can fail in deriving advantage from a consultation of his work. I only regret that for the present I can give no more extended account of it.

LEON VIDAL.

* Published in this country by Messrs. Piper and Carter

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CONTENTS.

RECORDS OF SUNSHINE.

THE little instrument which was brought before the Photographic Society by Capt. Abney once more warns us that science is on the move, and that photographers, amongst others, will have to give it all the aid they can in its march. A record of sunshine will prove very valuable if it can be taken in every part of the country, and, more still, of all over the world. The interposition of cloud between our earth and the sun, if it can be shown to be periodic, may lead to important deductions being drawn, some of which will be true and correct in the main, though no doubt at first mixed up with others invented by too venturesome spirits. To photographers this little instrument is more especially adapted, though we do not see that anyone may not use it with the greatest ease. The principle on which it is based is that of making an image of the sun to be formed on a piece of sensitive paper enclosed in a semi-cylindrical box by causing the light to pass through a hole in the lid; as the sun moves, it leaves its track on the paper when it shines.

Some of the specimens we have seen since the meeting of the Photographic Society were highly interesting. There was evideuce of fairly bright sunshine on many of the strips, but, in one, which is a record of a day which was apparently cloudless, there is much to interest. The sun had made its track in the usual mauner, leaving a black line as a tell-tale; but, in some parts, the track was much lighter than others, apparently for not many minutes together, and then we have a dark line again. Capt. Abney informs us that he could not find the cause of these variations by anything absolutely visible, since the sky appeared absolutely cloudless. Evidently something intervened to diminish the power of the sunshine, and it was probably the invisible vapour to which Professor Stokes referred at the meeting of the Society. As sunshine must affect skylight as well, a study of these phenomena will probably repay the attention required for it, as it may indicate the cause of such varying exposures as are required on days such as we are having now, and shall have with greater variety in the spring. An east wind, for instance, Mr. Dixon warns us against, and he gives advice not to photograph in the Zoo on days when this wind prevails; and perhaps the records of sunshine will indicate that there is something then wanting in the light with which we are not at present cognisant. Captain Abney pointed out at the meeting of the Society that, as a commercial precaution, such records would be desirable. For instance, in wishing to dispose of a business which lay in some spot which the sun favours with more of its presence than it does London, it would be a telling addendum to an advertisement to add that the sun shone so many hours more than it did at Greenwich, and refer to the sunshine records.

We think that, perhaps, for laymen, a cyanotype paper would be better than ordinary silvered sensitive paper, as the mere application of water to the former would suffice to fix it. It might be objected that cyanotype paper is not sufficiently sensitive, but we think that we can safely say that there is no necessity for it to be slow, and we propose shortly to revert to the subject of increasing its sensitiveness. The importance of the records of sunshine being obtained has been recognised by the Meteorological Committee of the Royal Society, and thirty different instruments of the revised Campbell type have been sent to various stations, these instruments depending for their action on the calorific effect of the sun's rays, which are collected in a point by a glass ball on to the surface of dark-coloured paper. Unfortunately, paper that is charred will smoulder, and it is quite possible that the apparent records of sunshine given by these instruments may be somewhat in excess of the true value. With the photographic instrument this source of error is eliminated, and we cannot see that any other is introduced.

It may not be uninteresting to recall the fact that, for a long series of years hemispherical wooden bowls were exposed to the action of the sun's rays collected by a glass ball to act as a lens (which was the original plan introduced by Mr. Campbell), and a rough comparative measure of the quantity of suushine received on one point of tha earth's surface was made by Professors Roscoe and Balfour Stewart. Each bowl, which was charred by the action of the sun of six months together, was weighed, and the charred tracks of the sun then filled with paraffin, and again weighed. The difference in weight enabled an approximation to be made of the amount of wood consumed. The results came out that in years of maximum sun spots we had the greatest amount, or, at all events, the most powerful sunshine. By keeping a record of the duration of sunshine for the next few years we shall be able to infer which caused the excess of charring of the wood at these periods, whether the *quantity* or *quality* of the sunshine. We can cordially endorse Capt. Abney's invitation to photographers to aid the cause of science, when it is remembered how much photographers are indebted to men of science for the development of the art which they practise.

THE ADDITION OF A PHOSPHORESCENT BODY TO EMULSION.

MR. HENDERSON'S idea of adding phosphorescent sulphide of calcium to a gelatino-bromide emulsion can hardly fail to lead to results of considerable interest from a scientific point of view; while it may ultimately lead to an entire departure from the present usage as regards the practical working of the gelatino-bromide process.

Our readers are doubtless aware that, during the last few years, a highly phosphorescent material has been introduced into commerce under the name of Balmain's luminous paint; the pigment in this consisting of finely-powdered sulphide of calcium.

Any surface painted with this preparation absorbs those luminous radiations to which it may be exposed, and gradually gives out this light in the form of a bluish luminosity, a piece of cardboard the size of a C.D.V. painted with the preparation, yielding sufficient light to enable one to see the time by a watch; and this luminosity lasts, although to a less extent, for several days. Mr. Henderson procured some of this paint, and after having removed all traces of oil or varnish by means of suitable solvents, ground the powder with glycerine, and added it to a gelatino-bromide emulsion. Plates having been coated with this preparation, a very short exposure was given in the camera; but even this was found to be sufficient to excite the sulphide, and the phosphorescent light given out by this body proved equal to the task of fully impressing the gelatino-bromide film. We may premise

that the light given out by the calcium sulphide is of a very actinic nature, and it is not a matter for surprise that by Mr. Henderson's method the time of exposure should be very much shortened. It is, however, rather a crude proceeding to mingle the sulphide of an alkaline earth with a gelatine emulsion, and we hardly wonder that Mr. Henderson found himself growing weary of the strained conditions under which he was working, and the numerous difficulties arising from the presence of this foreign element in the emulsion—not the least of these difficulties being the almost absolute darkness which must be inevitably necessary in working such a method as that now referred to.

The illustrious Daguerre experimented largely with the phosphorescent sulphide of calcium, and although he was remarkably successful in its preparation, it is improbable that he ever produced anything which approximated in luminosity to the product now in the market. This experimenter, however, covered a surface with sulphide of calcium, and exposed it in the camera, after which he laid a sensitive plate on the excited surface. Under these circumstances the plate became impressed, and an unreversed Daguerreotype was the result.

Phosphorescent materials appear destined to play an important part in the economy of the future, and as an instance of the kind of uses to which such products may be put, we may mention that a few days ago we were in a city office, of which the ceiling was painted with Balmain's paint, and on excluding all external light the room was found to be fairly illuminated by the phosphorescence of the paint—large type being quite easily readable. Such a room would never be dark; sufficient light being absorbed during the day to last out the longest night. Moderately bright moonlight is about the nearest thing we can compare it to.

Notes.

Those desirous of forwarding pictures to the Winter Exhibition at Vienna are informed that packages will be received at the office of this paper for transmission to Dr. Hornig, the President of the Vienna Photographic Society.

Chloride of silver emulsion *employed with development* is just now engaging the attention of Dr. Eder and Captain Pizzighelli, who will submit their results shortly to the Imperial Austrian Academy. Touching the subject, Dr. Eder writes:—"We have obtained by its means diapositives of wonderful beauty with an exposure of a few seconds only; and in respect to gradation and tone, I do not think any other process can give such perfect results.

The Greenwich Union employs photography to aid in restoring lost children—or, rather, to find out the parents who have lost their children designedly. A photograph of the deserted child is exhibited, together with particulars of the missing parent. The exhibition of children in want of their mothers in this way has its ludicrous side as well as its painful one. Some of the pictures are quite comic, and forcibly call to mind that little American brat who was found on the steps of the Capitol at Washington, reproaching its absent mother violently with, "I told the old stupid she'd lose me."

M. Ladislas Kornazewski has been occupying himself with the preparation of a collodio-gelatine emulsion. He makes a mixture with equal parts of alcohol and glacial acetic acid, and adds to one hundred cubic centimetres of this liquid one gramme of pyroxyline. The pyroxyline dissolves and forms a normal collodion, with which, subsequently, ten grammes of dry gelatine emulsion are mixed. A water-bath supplies sufficient heat to dissolve the gelatine.

A delicate spectrum method of testing for minute traces of bromine and chlorine has been proposed by M. Lecoq de Boisbaudran. He fuses on the hooked lower end of a platinum wire some pure carbonate of baryta; places in the bend a drop of the liquid to be examined; then evaporates, heating momentarily to a nascent red (with partial fusion); another platinum wire is then brought near the bend from below, and the induction spark gives a spectrum with lines of $BaCl_2$ or $BaBr_2$. The $\frac{1}{300}$ mgr of chlorine or bromine may be thus detected.

Dr. Eder has been trying the effect of fuming the gelatino-bromide film with ammonia, permitting the vapour to act upon the plate for a period of from three to five minutes. The treatment seems to be decidedly advantageous, for negatives from fumed plates exhibit much more detail than those produced from unfumed films exposed and developed under similar conditions.

It is a well-known fact that in the collodio-chloride process fuming with ammonia increases both the vigour and detail of the image. Indeed, in reproducing negatives by printing upon a collodio-chloride plate, the result is rarely satisfactory, unless the sensitive film has been previously fumed with ammonia; if this precaution, however, is adopted, the process is admirably adapted for the reproduction of negatives, either from a plate or from a print.

A correspondent finds that the pyrogallic developer made up with water acidulated with citric acid answers exceedingly well for the development of gelatine plates. The developer keeps as well as if made up with spirit, and the use of sugar or glycerine is rendered quite superfluous. Moreover, there is no formation of bubbles on the plate, defects which sometimes mar the excellent results obtained with the glycerine and sugar developers. Mr. Cowan mentioned the advantage of a citric pyrogallic developer to us some weeks ago.

All public museums and galleries in France are open to the photographer if he gives his word not to employ the wet collodion process; so long as he does not bring with him a bath, or fluid collodion, he is welcome to make photographs of any of the State collections. To a wet-plate photographer the condition has been a little irksome; but, with the advent of gelatine emulsion, the last barrier is removed. How long will it be, we wonder, before the gelatine worker is admitted to the same privileges in free England?

The small coffee percolators, so much used in Paris, can be made to do good service to the gelatino-bromide worker—

the collotype or the carbon printer.

The size sold for making one cup of coffee can be bought for a franc, contains about eight fluid ounces, and is suited for small batches of emulsion; while larger ones, capable of holding several pints, are more especially useful to the carbon printer.

In obtaining these percolators, it is important to select those made of a kind of earthenware which is vitrified throughout, or serious mischief may result from old and partly-decomposed chemicals being conveyed into fresh batches.

Many are the failures in emulsion work which may be traced to use of vessels made of porous earthenware; but a vitrified stoneware or porcelain may be used with safety.

"I don't call her pretty at all—not out of the way, I mean to make a fuss about." "Lor, she's just like our Emmar!" said another fair critic from the country, inspecting Mrs. Langtry's portrait. Verily, photography levels all

How far photography is responsible for the levelling or radical notions of the day, it would be difficult to say; but there cannot be a doubt that the "divinity" that "doth hedge a king" has suffered something since photography began to show, and show repeatedly, that kings and queens are as other men and women. The Prince of Wales and King of Greece smoke cabañas much as other people do, and the Princess of Wales occasionally stoops to give her children a pick-a-back, and doesn't mind if the public see her.

But photography levels even more than this. The portraits of Queens and Princesses are looked at with interest, but do not command the admiration bestowed on other fair portraits in the shops and bazaars. All the portraits on the line are stars of some sort, and therefore arrest attention; but here, as in the heavens, the falling star appears most brilliant, and is gazed at with special eagerness.

Lest our readers should take alarm at the forthcoming "At Home at Millbank," we hasten to assure them that, temporary imprisonment notwithstanding, we hope still to conduct this journal as usual. Captain Shandon, it may be remembered, edited the first *Pall Mall Gazette*—a journal written by gentlemen for gentlemen—from the Fleet Prison.

Topics of the Day.

THE MOOT POINT IN EMULSION MAKING.

BY DR. J. M. EDER,

Instructor in Photo-Chemistry at the Technical High School of Vienna.

I AM glad to have been successful in again raising as a subject of discussion the question—Is the addition of iodide or chloride to a bromide of silver emulsion of any value?

1. I have been taken to task for adducing in my work on gelatine emulsion the objections of experimenters who work exclusively with collodion. Now, I did this rather as a matter of courtesy to my precursors, holding it, as I do, to be the duty of everyone who writes on a subject to recognize the labours of those who have previously done anything in the same line; I have made my own experiments, and rest my opinions on my own observations. One point only I will now mention. Silver iodide alone, whether in a collodion or in a gelatine emulsion, gives no latent image which can be developed by alkaline pyrogallic or by ferrous oxalate, at least not with the usual duration of exposure. The statements of Bolton, of Vogel, and of Davanne, although their experiments were made with iodide of silver generally, are quite convincing on this point.

2. I will not deny that highly-sensitive plates may be got with iodo-bromide of silver; Captain Abney has submitted quite sufficient proofs of this fact. When I am told that instantaneous pictures have been taken with iodo-bromide plates, I am quite ready to believe it, and am far from wishing to assert the contrary. But the following facts I have established by my own experiments:—

a. An emulsion of gelatino-bromide of silver containing one-twelfth of iodide is distinctly less sensitive when the emulsion has not ripened—that is, an emulsion which is used directly it has been prepared, without cooking or the addition of ammonia. With the same exposure and development an iodo-bromide plate gives less vigour and less detail in the shadows; only with a more powerful developer will it overtake a pure bromide plate, while, moreover, the development is slower.

b. An iodo-bromide emulsion prepared with ammonia is, under the same conditions, less sensitive than the emulsion *a*, even when it has been longer digested.

c. In general, we may say the differences in sensitiveness between a bromide and an iodo-bromide emulsion disappear more and more in proportion as the heating is continued longer, and at a higher temperature. In a word, pure silver bromide emulsion appears to ripen more quickly than one of iodo-bromide, although the latter will gradually overtake the former. No doubt an iodo-bromide emulsion may be digested for a longer time without producing fog, since the iodide keeps clear. On these grounds, an iodo-bromide of silver emulsion, digested at a gentle heat, stands behind one of pure bromide; but when heated to boiling point it is probable that the difference disappears altogether, for the reason that the alteration in the constitution of the emulsion takes place much more rapidly at that temperature.

d. I wish to draw attention to another circumstance. According to Abney, the iodo-bromide emulsion is the less sensitive in the yellow in proportion to the amount of iodide that it contains. Pure silver bromide has the greatest sensitiveness to colour. In this respect, iodo-bromide emulsion resembles the less sensitive modification of silver bromide; this, however, may be a coincidence.

e. In this sense must be taken my assertion that iodide of silver renders the bromide emulsion less sensitive, and with that, I believe, the difference of opinion between Captain Abney and myself is cleared up.

I ought to add that I have never maintained that iodo-bromide will not keep, or that it does not work clean. It is true silver iodide is apt to give a flocculent or coarse-

grained emulsion; but this defect cannot arise if Abney's directions are followed, namely, to add the iodide only when the silver bromide has been completely incorporated with the emulsion. What I do assert is, that all the effects in the character of a negative which are attributed to iodo-bromide of silver can be produced with the appropriate development in pure bromide plates. I hold that the superiority of iodo-bromide, which the partizans of that substance vaunt so highly, is not made out to such an extent as to make me personally willing to accept it. There are also others who are prevented from becoming adherents of the iodo-bromide process, owing to the disadvantages it possesses, especially its ripening so slowly at a low temperature, and its liability to spoil when ammonia is used. However, I do not wish to say anything for or against iodide of silver, but only to bear my share in elucidating the question at issue.

3. On the other hand, I must take up a very determined position against the use of silver chloride in bromide emulsion, and seize this opportunity to examine closely the opinion which Mr. Barker has expressed in a contemporary. Mr. Barker seems to have an idea that I have not studied sufficiently the behaviour of gelatino-chloride. Now, I do not think I am boasting when I assert that I have a thorough knowledge of gelatino-chloride emulsion. Captain Pizzighelli and I have had so great an experience of this substance, and of its development, that we are able to take with it transparent positives of faultless beauty, and completely to regulate their character. These pictures will be exhibited in the Vienna Exhibition; but we shall not yet give a description of our method, as we do not wish to forestall the publication of our Academy. I think, therefore, I have a right to be heard on the chloride of silver question.

a. A pure chloride of silver emulsion cannot endure a development either by means of pyrogallic without bromide, or by means of ferrous oxalate as used for silver bromide. Even when carbonate of soda is employed as a restrainer, there will be scarcely the trace of a picture; but a fog is produced which penetrates slowly below the surface of the image. It is incorrect to say that the slightest action of light is developed upon chloride of silver; on the contrary, an emulsion of gelatino-chloride is much less sensitive than even the worst bromide emulsion. A chloride emulsion gives with the developers usually employed for silver bromide scarcely the ghost of a picture, but considerable fog; whilst the bromide emulsion develops brilliantly, rapidly, and vigorously.

b. A gelatine emulsion of bromo-chloride is therefore a mixture of which one part ($AgCl$) is very little sensitive, and quickly fogs; while the other part ($AgBr$) develops normally. Silver chloride requires, in fact, quite other developers than silver bromide.

c. Mr. Barker asserts that he is able to develop his iodo-bromo-chloride plates without any restraining soluble bromide, and hence he concludes that I am in error, since I had stated that there was always fog in chloro-bromide plates, unless there be added to the developer sufficient bromide of potassium to transform to bromide of silver all the chloride. I still, however, adhere to my statement. Anyone who tries with the alkaline pyrogallic developer to develop a chloro-bromide plate (that is, one containing, besides the iodo-bromide, one-sixth of silver chloride, according to Mr. Barker's own formula*) will get a highly-fogged image, unless he has added some bromide to the developer. Even when a little soluble bromide is present it is very difficult to avoid fogging. With oxalate a better result is obtained, though even then a superficial fog is produced, due to the silver chloride; in this case, however, it does not penetrate so deeply, because in the meanwhile silver bromide is reduced. Hydrobromic acid, however, separates, though Mr. Barker has forgotten this fact, and a small quantity of that substance in the ferrous oxalate acts as a powerful restrainer on silver chloride. Consequently Mr. Barker, without knowing it, towards the end of the operation, always develops his iodo-bromo-chloride plates with a little restraining bromide.

d. In consequence of the fog covering more or less the image on chloro-bromide plates, the deep shadows print better, and appear more vigorous. But silver chloride alone cannot introduce photographic drawing; it acts rather by producing the non-photographic reduction of silver. If, however, I wish to obtain this sort of coating I can do it by developing my pure bromide plates with more ammonia, or by employing the slightest possible after-exposure.

e. The tendency of chloro-bromide emulsion to fog can be lessened by the addition of ammonia. But iodo-bromo-chloride represents a mixture of which one portion, the AgI, is not at all reduced by the developer: it acts only mechanically in separating the particles of bromide, and so restraining their reduction. The second portion, the $AgBr$, is the actual image former; on this substance exclusively is the latent image brought out by the developer. The $AgCl$ which is the third portion, receives during the short exposure a most imperfect latent image, and this image cannot be developed, since the developer is so powerful that the whole of the silver-chloride even in the non-exposed parts is reduced. For silver iodide, the ordinary pyrogallic or oxalate developers are much too weak, so that none of the salt is reduced; while for silver chloride they are much too powerful, and reduce the entire film. It sounds very interesting to be able to regulate the proportions so nicely that the fog-repelling properties of the silver iodide can just counteract the fogging of the silver chloride, so as to allow of the silver bromide developing uninterruptedly; but I still maintain my opinion that iodo-bromo-chloride of silver is an unmanageable mixture, and I think that what I have said above proves it.

4. Several have asked why I employ so great an excess of potassium bromide in the preparation of emulsion. I may say that with such proportions there is not the slightest fear of introducing an excessive amount of silver nitrate into the gelatine emulsion, even should the quantity of the latter have not been very carefully weighed out. There is, however, another reason; the excess of potassium bromide is recommended in the case of an emulsion with ammonia, because the tendency to fog which an ammonia emulsion exhibits when the gelatine employed is not very good is thereby nullified. The best antidote is an abundant excess of soluble bromide, as I have already often stated. I believe that a similar relation is advisable in the case of an emulsion prepared without ammonia, but digested for a long time at a gentle heat. It is true that a great excess of potassium bromide restrains the ripening of the emulsion, but when it has been allowed to simmer for from twelve to eighteen hours at a temperature of 35° C., no difference can be detected, and the emulsions will be found to be equally sensitive. A large quantity of potassium bromide therefore renders subsequent operations much more certain.

The "Topic" for next week will be, "On Interiors," by George Bradforde.

ENLARGING BY THE GELATINE PROCESS.

BY H. J. PALMER.*

At this time of the year the photographic opportunities of most of us—as amateurs—are of necessity very limited in their character; but the production of enlarged copies of smaller negatives taken during the past season is an employment for a winter's evening full of interest and conducive to results of a very pleasant kind.

The gelatine process enables us to practise the art of enlarging without the expenditure of an undue amount of time or of means.

* See Photographic News, page 235.

* Abstract of a paper read before the Liverpool Amateur Association.

For, with a sciopticon—or, indeed, with any of the numerous modern lanterns provided with a duplex or triplex paraffine lamp—an enlargement on a gelatine plate of the largest size, and composed of a slow-but-sure emulsion, may be made in from five to ten minutes. And then, with regard to cost, a plate 20 by 15 may be sensitised with a gelatine emulsion for an expenditure of threepence or thereabouts; and the mode of procedure is simplicity itself.

I will give a brief account of the preparation of a plate. I used an emulsion consisting of 20 grains of gelatine, 12 grains of silver, and 8 grains of bromide of ammonia to the ounce. This was prepared in the evening, in a concentrated form, *i.e.*, with half the necessary amount of water, and placed on the bottom or warmest shelf of the drying cupboard, in close proximity to the opening at the apex of an iron cone, with a small gas-burner below. Having been left all night to cook, in the evening it was poured out into a porcelain dish, placed under a dripping tap of cold water till business hours were over in the evening, and then, after draining and warming, it was poured through glass wool into the porcelain cup of a child's food-warmer, and the whole brought up to its full quantity by addition of alcohol and water in equal proportions.

A plate was now made comfortably hot at the fire, and placed on the open palm of the left hand. Three ounces of emulsion which had been measured out in a warm measuring glass, were poured on to the centre of the plate in a pool of circular shape, and even distribution over the surface was effected by means of the fingers of the right hand. No glass rod or contrivance of any kind that I have met with can compare with the fingers and hand as distributors of emulsion over the surface of a large plate; but I do not recommend their employment for this purpose if they have been recently in contact with the hyposulphite—or, indeed, with anything save soap, water, and towel. A large surface of gelatine sets very speedily, and therefore as little delay as possible was employed before the plate was deposited on the levelled shelf I have noticed that there is a considerable difference between the rapidity of setting of gelatine of various makes. Nelson's photographic gelatine sets more quickly than the opaque, and the French Coignet is the slowest of all. I recommend this last, then, as the preferable kind for sensitising plates of large size.

The crux of the gelatine process for amateur makers of plates lies in the drying. A small plate can easily receive an alcohol bath, and so be speedily ready for exposure; but that is not so practicable with a film of large dimensions. The difficulty in the way of the use of alcohol lies in the fact that it removes all varnish from the wooden trays in which it is applied to plates of large size, and porcelain trays are not usually to be found of sufficient capacity in our laboratories.

The great secret of success in coating plates of considerable size rests with the amount of emulsion poured, in the first instance, upon the surface to be covered. If this quantity be insufficient it will be impossible to flow the gelatine over the whole of the plate, and the result will be misery and mess. I mentioned three ounces just now as the quantity necessary for a 15 by 20 plate; but it will be found far better to have courage to pour much more than this upon the warm surface first, and after flowing it nicely round the edges and corners in succession to return the surplus to the vessel. This, I think, is the secret of successful coating of plates of all sizes—to have the courage to pour a plentiful pool of emulsion at the first. I recommend the palm of the hand as the best plate-holder; for I have never yet met with an artificial contrivance which could be depended upon to keep a firm grasp upon its plate until coating was completed.

There is no need of apparatus of any kind beyond an ordinary lantern and a transparency for the production of a gelatine enlargement. I usualy employ a plate-box accurately placed in a parallel position to the plane of the lens of the lantern, and against this I rest a sheet of cardboard for focussing, and the sensitive plate afterwards. The time of exposure depends, in the first place, upon the sensitiveness of the emulsion employed; and, in the second place, upon the size of the enlargement. It is not likely ever to exceed ten minutes, though it may be modified also by the density or thinness of the transparency employed. It should be borne in mind, in connection with this subject of enlarging by the gelatine process, that small negatives which are worthless for printing, from over-exposure, are often capable of producing very fine positives with the lantern. And nothing can exceed the beauty of an enlarged positive on a opal plate when rightly exposed and developed with ferrous oxalate.

Correspondence.

MOONLIGHT PHOTOGRAPHY.

DEAR SIR,—Allow me a few words of explanation to Messrs. D. H. Cussons and Co., in reference to a statement in my brother's paper, read before the Edinburgh Photographic Society.

The lens used for taking the moonlit views was one of Ross' small quick-acting portrait lenses, full aperture, and with the plates used—the most rapid commercial plates—the exposure for a view with mid-day summer sun would not have been more than $\frac{1}{100}$ of a second. This will at once explain the matter. The exposure actually given was about eight hours.

Having now made explanation to Messrs. D. H. Cussons and Co., we should be very glad to know from them what plates they used to enable them to get a fully-exposed photograph with an exposure of one-sixteenth of what my brother found necessary.—I am, sir, your truly,

W. K. BURTON.

THE NEW YEAR.

DEAR SIR,—May I be permitted, as an old subscriber, to make a suggestion. It is that, as was the custom to within a few years ago, the index to the number be printed at the commencement, instead of in the middle, of the paper. This will be but reverting to the old order of things, and speaking not only for myself, but for several other readers of the NEWS with whom I have spoken, I can assure you the step would be regarded generally as a convenience and a boon.—Faithfully yours, H. P. ROBINSON.

ALUM AND HYPOSULPHITE.

SIR,—Captain Abney has called our attention to the fact that alum has the property of destroying any trace of hyposulphite of soda which may remain in a negative after fixing and washing. He would confer a benefit on the public if he would inform us whether there would be any danger in using alum to eliminate the last trace of hyposulphate from silver prints.—Faithfully yours,

JOSEPH PAGET.

[This method is already resorted to, and appears highly satisfactory. See "Correspondence" in NEWS of last week. —ED. P.N.]

TRIUNIAL DISSOLVING TAP WITH ONE PLUG.

SIR,—Permit me to say I designed such a tap in the autumn of 1875, and completed one in the autumn of 1876. It is scarcely larger than ordinary biunials; the plug moves about one-sixth of its circumference. It is impossible that mine and the one described in your last issue could be copies of each other; yet the changes between any one or separate pairs are much similar; but in dissolving from all three, to two or one, there is a marked difference. In the case of my tap, either change can be attained without passing over any places indicated for other effects, or trusting to the incandescent lime to keep up the illumination; yet a skip in some positions can scarcely be avoided; hence I do not consider it perfect, but, in use, I find it equal to the requirements of any exhibition. I had only one made, and few but friends ever saw or heard of it. I designed another (not yet completed), which I still think will be very near perfection. More than two years have passed since I did anything with either of these taps, and I had a difficulty in finding the completed one, at the request of our Secretary, to show it at the last meeting, press of other matter preventing its efficiency being tested. WILLIAM HELLAWELL.

Proceedings of Societies.

Photographic Society of Ireland.

A meeting was held in the Royal College of Science, on Friday, the 10th inst., at 8 p.m., Mr. Thomas Arthur Bewley in the chair.

The minutes of the previous meeting having been read and confirmed, the following new members were declared duly elected :—Arthur L. Barbe, Florence Villa, Merrion; and Graves C. Armstrong, Belgrave Square, Monkestown.

Professor Hartley then read a paper on "Photographic Transparency, or the Application of Photography to Chemical Research," and defined photographic transparency as the power which colourless substances possess in different degrees of transmitting the ultra-violet or photographic rays. During the last eight years he had been engaged in researches on this subject, the foundation of which was laid by Professor Stokes, of Cambridge, and the late Dr. W. A. Miller, of King's College, London. The researches of the latter were made by the aid of photography, but Professor Stokes used fluorescent screens for investigating those almost invisible rays. The method of photographing spectra with quartz lenses and prisms in such a way that the least refrangible and most refrangible rays were in focus at the same time was next described, and the sources of the ultra-violet rays was stated to be a succession of electric sparks obtained by means of an induction coil and Leyden jar, the sparks passing between electrodes of nickel wire containing a trace of copper. Small vessels with sides composed of plates of quartz were exhibited, which were used for holding the liquids under examination, and an instrument which was a combination of spectroscope and photographic camera was shown. Photographs were handed round of the spectra of various metals, including aluminium, iron, nickel, and cadmium. It was stated that the substances quartz, Iceland spar, and water were practically diactinic, that is to say, photographically transparent. A diagram exhibited the fact that the ultra-violet or invisible photographic rays constitute a spectrum at least five times as long as the visible or coloured spectrum, but the purest optical glass made by Fiol, of Paris, cut off nearly all this ultra-violet portion. A sketch of the investigation as originally planned was then given, and the results of the examination of a large number of organic substances made in conjunction with Prof. Huntington was then stated in detail. Examples showing the extraordinary delicacy of the method in the detection of minute traces of impurities in organic substances were mentioned. The supposed constitution of various series of organic substances was then stated. The peculiarities of the linking together of the carbon atoms in alcohols and fatty acids, essential oils, benzine and its derivatives, naphthaline and anthracine, are capable of being recognised by the degree and character of the photographic transparency of these compounds. The degree of dilution which some of the substances named will withstand before they become capable of perfectly transmitting the ultra-violet rays is extraordinary; for instance, in the case of benzine the substance may be mixed with 2,500 times its weight of alcohol; naphthaline with more than 400,000 times; and anthracene with 50,000,000 parts of alcohol. Photographs showing the bands of absorbed rays characteristic of this latter substance were exhibited and compared with a photograph of the alcohol used in the experiments. These researches promise to throw light on the constitution of many carbon compounds. Prof. Hartley stated that difficulties were encountered which proved almost insurmountable when the wet collodion process was at first employed, and that the success of the work was largely owing to the fact that gelatine plates, which could be bought in large quantity, and kept almost any length of time, were admirably adapted for the purpose.

A vote of thanks having been passed to Professor Hartley for his interesting communication, the meeting adjourned until the 14th Jan., for which date Mr. George Mansfield has kindly promised a paper on the "Platinotype Process."

Manchester Photographic Society.

Mr. A. Brothers, F.R.A.S (president) in the chair.

The minutes of the previous meeting were read and confirmed. The ballot was taken, and the following gentlemen duly elected members of the Society :—Mr. J. T. Bainbridge, Hazel Grove, Stockport; Mr. J. Butterworth, Globe Iron Works, Burnley; Mr. S. F. Flower, 133, Stockton Street, Moss Side, Manchester; Mr. James Gartside, Park Road, Oldham; Mr. J. R. Hinnell Town Hall Square, Bolton.

The Hon. Secretary then proceeded to describe a number of exhibits from Mr. Werge, of Berners Street, London, amongst, which were a table tent, a non-actinic lantern for the dark-room, a non-actinic tray for developing plates without a darkroom (in the field); besides a large size art study in carbon, a highly instructive series of pictures illustrating the process of photography had been sent by Mr. Werge, and were objects of much interest to many of the members. A drop shutter and several very excellent photographs of shipping, &c., taken by its use were shown by Mr. Blakeley.

The Hon. Secretary, on behalf of Mr. Kennerley, of Llandudno, exhibited another instantaneous shutter (a double flap shutter).

Mr. J. B. Robinson said he had one similar to this many years ago, and objected to it on account of it exposing one portion of the plate before the other portion.

Mr. John Chadwick said such was more or less the case with many instantaneous shutters.

Mr. Lynde exhibited several stereoscopic paper slides, some mounted on yellow cards, and duplicates mounted on green cards; these prints were all made at the same time, and toned and fixed and washed under the same conditions, and had been mounted three weeks. But those mounted on the green cards were very much faded, whilst those on the yellow or tinted cards were perfect.

Mr. Heywood said the fading was due to copper used in the preparation of the green colour of the card.

Mr. E. Leader Williams exhibited a very excellent negative taken on a gelatine dry plate of his own manufacture, intensified by Dr. Monckhoven's process; he considered the process worthy of trial in case of transparencies.

Mr. C. Pearson, Jun., then read a paper on the subject of a new optical phenomena, and illustrated the same by means of sketches, and was prepared with some lantern transparencies to still further illustrate the subject of his paper, which he would show in the lantern later in the evening.

Mr. Mallalieu exhibited some very excellent stereoscopic negatives taken on gelatine dry plates of his own preparation.

Mr. W. J. Chadwick (the Hon. Sec.) then introduced the lantern subject, and said the Rev. W. F. Faulding, of Mossley, had been kind enough to come down by his invitation to show them a most elaborate triple lantern constructed for him by Messrs. Ottaway, and one of the special features was a triple dissolving tap actuated by one handle and with one plug, the invention of Mr. Faulding; and whilst this lantern was being set up for work in the adjoining room,

The Hon. Secretary called attention to a very complete and efficient biunial lantern sent down by Mr. J. H. Steward, of the Strand. The lantern was that known as the "Luke Lantern," and was provided with a slide, roller, curtain, apparatus, jets, and dissolving apparatus of the most perfect kind. The compactness of the apparatus and excellent workmanship were much admired by most of the members.

Mr. J. Hallewell exhibited a triple dissolving tap with one plug and one handle, which he had made a long time ago, but was not provided with appliances at the meeting to show it in action (see Correspondence).

Mr. W. J. Chadwick said he had never seen a perfect triple dissolver with one plug and one handle, and felt interested very much in the subject, and was looking forward with much pleasure to the practical demonstration of Mr. Faulding's invention; in the meantime he exhibited a single dissolver, and said it was the same kind he had adopted for his own triple lantern a long time ago, using one to each jet. The members now retired to the lantern room, where Mr. Faulding proceeded to describe his lantern and dissolving arrangements, and illustrated by diagrams on the screen; several effects were shown to illustrate the working of the tap.

A large number of transparencies were then handed in from the members, and a little interest was displayed by a competition between Mr. R. Atherton and the Hon. Secretary. Mr. Chadwick had prepared some transparencies by the collodio-albumen process, whilst Mr. Atherton made some by gelatine from the same negatives—very hard ones. The opinion of the members was decidedly in favour of the collodio-albumen; but Mr. Atherton said he had no doubt before long he would improve as he had more practice, for he had only just begun to work the process for transparencies, and, like all other things, wanted properly understanding.

Some good work was exhibited by Messrs. Grotuse, Mallalieu, Brothers, Coote, and others, and a great many slides were unable to be shown, as the hours had advanced, and time would not permit. A most cordial vote of thanks was passed to Messrs. Faulding, Werge, and Stoward, and all the gentlemen who had taken part in so highly interesting a meeting, and the members adjourned until January 13th, 1881.

Glasgow Photographic Association.

The first annual Exhibition of competition and other pictures contributed by the members of the Association was held in the Religious Institution Rooms on 16th inst. A large number of ladies and gentlemen visited the Exhibition during the day The display of pictures, though small, was good, and consisted of two classes—those sent only for exhibition, and those sent for competition. Among the latter a landscape by an amateur gentleman, Mr. Edwin Smithills, of Barrhead, gained the President's Prize against professional competitors.

Mr. James McGhie gained the first prize for the landscape competition, open to the whole Association ; while the prize for the best figure subject in the competition, open to the whole Association, was awarded to Mr. William Brown, photographer, Paisley.

For the best landscape (confined to amateurs), Mr. John Parker received the first prize, and for the best figure subject (confined to amateurs), Mr. James S. Gardner received a similar award. The remainder of the pictures, including several photogrpahs on opal glass, were considered very fine, and received attention. Three excellent specimens of Luxograph pictures were shown by Messrs. Turnbull, and Mr. Urie (the President) exhibited specimens of gaslight photography.

Messrs. T. and R. Annan exhibited some very effective landscapes and figure subjects.

The Judges, Mr. Wallis McFarlane of Saracen Foundry; Mr. Andrew McTear, lithographer ; Mr. J. G. Tunny, photographer, Edinburgh, were entertained to dinner by the Council of the Association in Mr. Thornton's Restaurant, Buchanan Street, and amongst other gentlemen present were, the President, Treasurer, Secretary, and Messrs. John Jex Long, Thomas Annan, and John Parker. Various matters relating to the Association were discussed, and several toasts were given and responded to, after which the Company parted.

Amateur Photographic Association.

A council meeting of this Society was held on Thursday, the 16th inst., at York House, York Place. The Right Hon. the Lord de Ros in the chair. The minutes of the last meeting having been read and confirmed, the following members were elected :—Col. Thomas Duff Cates, Messrs. S. P. Jackson, Richard Cecil Corbett, H. S. Schultep Young, and His Highness the Rajah Rampal Singh.

Mr. Glaisher then read a number of letters from various members expressing their satisfaction with the prizes they received last year.

The Secretary then laid the following prizes before the Council:—A large silver goblet, in case, for Mr. W. Vanner ; a silver goblet each for Messrs. W. S. Hobson and F. Schwabe; an album each for Messrs. R. Murray, J. W. Leigh, S. Norman, and Major D. Mac Niell; Mr. R. O. Milne, a water-colour drawing in frame ; Mr. R. Leventhorpe, a water-colour drawing in frame; Mr. A. Suzanne, a painting in frame.

Dr. Arthur Farre, and the other Members of Council, expressed their satisfaction with the prizes, especially with the water-colour drawings.

Mr. Gooch considered that the prizes were, on the whole, the best that had been given by the Society.

It was decided, at the suggestion of Captain Lewis, that new prospectuses be at once printed, as several changes had taken place since the last were issued.

Liverpool Amateur Photographic Association.

The monthly meeting of this Association was held on Thursday, the 16th inst., at the Free Library, Mr. J. H. T. Ellerbeck, President, in the chair.

The minutes of the last meeting were read and confirmed.

The Secretary laid before the meeting a communication from the Dundee and East of Scotland Photographic Association relative to the Exhibition there, and requesting members to transmit apparatus or prints.

The Association then proceeded to make the necessary arrangements for a display of pictures and apparatus at the *soiree* of the associated scientific societies of Liverpool, on the evening of the 22nd inst.

Dr. Kenyon showed a highly-ingenious and successful adaptation of a s enograph to one of Rouch's new cameras.

The Secretary read a paper on "Enlarging by the Gelatine process," (see page—) and proceeded to illustrate his remarks by making an enlargement on a fifteen by twenty plate with the Society's lantern. The exposure proved to have been rightly timed, and the resulting negative was sufficiently dense; but, owing to the warmth of the room, the plate frilled under the developer.

The meeting afterwards adjourned till the last Thursday in January.

To Correspondents.

W. Brown (Camberwell).—You will find full information in Mr Blanchard's article which appears in the Year-Book for 1880.

Fred Rubbra.—We cannot give you any information about the firm in question.

Emulsion.—1. It is not easy to certainly alight on the cause of your troubles. Try, however, the effect of performing all your operations in a weaker light, and then you will doubtless be able to use a stronger developer. Plates prepared as yours, ought to be twenty times as sensitive as average wet plates. 2. The ammonium bromide should be in excess, but the washing ought to be sufficiently prolonged to remove this excess. 3. No. 3, St. Alban's Road, S.W.

P. A.—We can say from experience that the method of intensification to which you refer answers well if carried out in the full light; but it did not strike us to try whether it would give an equally satisfactory result in the dark room. Why not try yourself?

E. J. B.—1. You have altogether misunderstood the matter in question, as the image is formed in the film, and not on its surface. 2. Any alkali will serve, provided that it is not in too concentrated a state. 3. The alkaline carbonates are, with the exception of the ammonia salt, insoluble in alcohol.

L. Pewtress.—A flare spot of the kind which is so noticable on the picture you send, generally arises from oblique rays entering the lens. Such rays may be reflected from some bright point on the metal mounting or on the edge of the diaphragm. Blacken the edges of the glass and the inside of the metal-work with a mixture of melted size and lamp-black.

D. S. Stacy.—1. Several such series were shown at the late Exhibition of the Photographic Society. 2. No doubt an advertisement in our columns would enable you to obtain what you require.

Chas. J. Hall.—1. The films were doubtless of a very repellent nature, some hardening or tanning material having probably been added. Try plates from another maker. 2. A pyrogallic and silver re-developer is generally found to be more satisfactory than iron and silver. 3. We cannot say.

Northumberland.—In such a case everything should be weighed; and you can adapt the formula to your immediate requirements by considering the parts to represent grains, drams, ounces, pounds, or any other units of weight which you may select.

Doubtful.—The side which is least convex must be directed towards the sensitive plate.

Fred.—You certainly would not be justified in selling a person's portrait without his permission, provided that the portrait was the result of an ordinary sitting; but the idea of anybody vetoing the sale of an ordinary street view because he figures therein is altogether absurd.

Try Again.—1. Those most used are the ammonium, potassium, and cadmium salts. The former is much more subject to change than the latter. 2. To discuss the subject at all profitably would require more space than we can afford here.

A Subscriber.—There are many patents bearing on the subject, and it would be impracticable to quote from them all. You will, however, have no difficulty in procuring a specification of that patent in which you propose to take an interest ; but those proposing to deal should furnish you with a copy.

One in a Fix.—The gelatine you use is either far too soluble, or you have deteriorated it by the long-continued action of heat. Try Coignet's gold label gelatine. Your difficulty may also be met by the adoption of Captain Abney's method of coating the plates with plain collodion before developing.

H. L. Stevens.—A saturated solution is usually adopted for the work, but a mixture three parts of a saturated solution with one part of water answers equally well, and there is no fear of crystallization taking place in cold weather.

R. T. Glasgow.—We are unable to give you the information you desire, but have but little doubt that you will be able to obtain every information from those interested in the matter. You might learn something by reading the specification of any patents on which the undertaking may be based: doubtless you will find reference to these in the detailed prospectus.

The Photographic News.

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ON FOCUSSING FOR A VIEW.

THE usual method in which a photographer sets about to focus when he is going to take a view is pretty much as follows:—

Having settled the point from which he is going to take it, and having established his camera and determined what lens he is going to use, he places his head under the focussing-cloth and adjusts the distance between the lens and the ground-glass until some part of the view appears quite sharp. This is done either with the lens's full aperture, or with a large stop. Most photographers focus for whatever they consider to be the principal object in the view, which is generally in what may be termed the "middle distance."

When this much has been done, there comes the question, "What stop shall I use?" There are several factors to be taken into consideration in answering this question. If the photographer be a wise one, he knows that the use of the largest stop which will give definition will give the best picture—the picture with most atmosphere in it—and he tries to find out the largest stop that he may use; but, as he gradually inserts a smaller and smaller stop into the diaphragm slit, the light on the ground glass becomes so small that it is quite impossible for him to tell whether he has really got definition in the foreground and distance or not. At last he probably trusts either to former experience, or in despair he inserts a stop so small that he knows "it must give definition everywhere." The whole operation has probably taken some considerable time.

Now, it seems a pity to us, that this process should be gone through, when there is a means of finding out at once, and with absolute certainty, the largest diaphragm that may be used, and this with no more trouble than is involved in making a mental calculation so simple that any child could do it.

Here is the method. Let the photographer focus, with full aperture or a large stop, for a point which he considers to be about twice as far from the camera as is the nearest point which he wishes to be included in the view. Now let him estimate roughly how far the point, for which he has focussed, is from the camera.

If he have a good eye, it will be quite sufficient to guess it; if not, he can generally "pace" it in a few seconds, and this will be quite exact enough. This distance is to be divided by the focal length of the lens. The figure which is arrived at will represent, in hundredths of an inch, the largest diaphragm which may be used. Let us take an example. The lens is (say) a rapid rectilinear of eight inches equivalent focal length; the result would be the same whatever the lens, provided the focal length be the same. The nearest point in the foreground is about fifteen or sixteen feet away, so the photographer focusses for a point about twice as far away—that is, ten yards. The result of this is, *that the focus is evenly divided between the foreground and the distance.* Ten yards is forty-five times eight inches, therefore a stop may be used whose diameter is $\frac{45}{100}$ of an inch—practically half-an inch—or the next smaller.

This may sound complicated, but let any photographer try it; he will soon find that he can do this simple calculation five or six times over during the time another photographer is discovering, by the usual means, what diaphragm he may with safety use, or is finding out that he cannot discover it; and the former will have the satisfaction of knowing that he has put in that stop which will give him the very best, and, at the same time, the most rapid results compatible with good definition. This rule will be found specially useful where "instantaneous" results are aimed at, and where it is of particular advantage to be able to use the largest possible aperture. In such a case, of course, it is left entirely to the discretion of the photographer, whether he will not use a somewhat larger diaphragm than the one indicated by his calculation, thereby attaining greater rapidity by the sacrifice of some of the definition in the foreground and the background.

A case where special difficulty is experienced in discovering the largest admissible diaphragm, is in the case of a badly-lighted interior. Here it is often only after long straining that the photographer can manage to focus with full aperture, and when he begins to reduce this, he finds that he can see nothing whatever on the ground-glass.

It would be possible to give an exact rule for the largest diaphragm that might be used in such a case, but it would involve a formula far too complicated to be of any practical use. The following plan, however, will keep the photographer well within the mark. Let him focus full aperture, then divide the focus between the nearest and the most distant objects which are to be in the picture, as nearly as he can, by focussing first for one and then for the other, and turning his focussing screw to a point which he estimates to be half-way between these two points. Now guess or pace the distance of the nearer of the two objects. Divide by the focal length of the lens, and the result will be in *fiftieths* of an inch the diameter of the largest stop which may be used.

It often happens, especially in churches and cathedrals, that there is in the most distant part of an interior a window, which is the only object which can be seen with sufficient distinctness on the ground glass to focus. In such a case, focus for the window with full aperture, then estimate the distance of the nearest object which is to be part of the picture, divide the distance by the focal length as before, and the result will be the largest permissible stop in *hundredths* of an inch.

These last two rules only apply to interiors where the greatest distance is considerable, say, at least, forty times the focal length of the lens used.

Let photographers try this method of focussing, and they will find it surprisingly much easier than they think, and they will no longer be seen with their heads under the focussing cloth, and with one arm wildly flourishing about, as if asking assistance for its distracted owner, but really searching for "that confounded diaphragm slit," which would almost seem to have dropped out of the lens.

The above remarks apply only to the use of lenses which are able to give definition with full aperture to the margin of the plate used when photographing objects in a plane at right angles to the axis of the lens. If it be necessary to "stop down" merely to give definition at the edge of the plate, entirely new factors are introduced, and no rule can be given.

At Home.

MR. W. HARVEY BARTON AT LLAN HOUSE, BRISTOL.

"A Bristol Mansion in the Olden Time." The picture is so familiar, we need scarcely describe it. A lofty narrow building with peaked roof, storey above storey projecting; queer bay windows of mullioned glass, panels and quaint wood-work everywhere, and a prevailing air of antiquity

that calls vividly to mind times and events we read ofir n history. Here is something more than a dnsty page to e- mind ns of days long ago. With the picture before us, we can people the old house again: the grand dame with her hooped skirt and peaked bodice, her high-heeled shoes and flaxen curls; the sedan that will presently arrive to bear her ladyship to rout or card-party; the yellow waxlights in heavy candalabra soon to illumine the windows. By-and-bye, ancient Dogberry and the watch will come their rounds, and call the hours of the night. There is no vulgar vulgar lamp-post, or figure in modern attire to mar the delightful picture.

It is such a scene as Charles Dickens would have loved, one of those forgotten nooks and corners the great novelist always delighted to paint. Indeed, if we were asked to compare photographers with writers, we should at once pronounce Mr. Harvey Barton the Charles Dickens among photographers. And for this reason: not only does the Bristol photographer display a reverence and loving fondness in choosing his snbjects, but he treats those subjects as though he loved them. He is but their slave, and he works earnestly, conscientiously, indefatigably, and with his whole strength and will to do the best he can. Mr. Barton, in his true, straightforward manner, sacrificing all to the attainment of an artistic result, reminds us more of Rejlander than any living artist.

He relies upon himself and himself alone, fully conscious of the fact that when true to oneself, his work cannot be otherwise than genuine.

> "This above all,—to thine own self be true;
> And it must follow, as the night the day,
> Thou can'st not then be false to any man."

We have purposely dwelt upon Mr. Barton's rare treatment of architectural subjects, rather than on his excellence as a landscape photographer—and only those who know his sweet summer pictures are aware how high is his repntation in this branch of the art—because it is in architectural photography that we possess few, very few, masters. The difficult technicalities Mr. Barton has not only overcome, but by his choice and treatment he manages to inspire the pictures of brick and stone with sentiment and nobleness. Look at the lofty tower of St. Stephen's; it is delicately and harmoniously limned from base to spire; there are no inky shadows below, no eating in of the lights on high, and, above all, the grace and elegance of its proportions are fully displayed.

We cannot tell our readers how Mr. Barton manages to breathe this spirit of poetry into his pictures, bnt we can do this: we can place before them the subject of an hour's chat with a modest, kindly gentleman, who expressed himself over and over again not only willing, but anxious to place at the disposal of his brethren any experiences he might possess. Our first question was naturally touching the fine architectural views he had produced, and we are sure Mr. Barton's frank statements on this subject will be duly appreciated by our readers.

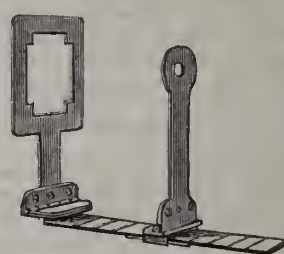
"I am afraid I hardly work in accordance with acknowledged rules," said our friend. "Many, about to take an architectural subject, begin by tilting the camera; this I always leave to the last. I first choose the highest station I can find—that tower of St. Stephen's was taken from a window thirty feet from the ground—and then choose the longest focus lens I can use. The third thing is to raise or lower the lens out of the centre of the camera; I do not know whether there exists in this country another apparatns besides my own that permits of lowering the lens below the centre; but it is, nevertheless, frequently a matter of necessity. Having done this, I finally tilt my camera and adjust the swing-back."

Mr. Barton then proceeded to detail other important points. Forty-five degrees is a convenient angle for the light to shine upon your object; a small stop must be used, and full exposure given, the usual stop employed with a 26-inch focus lens being from ½ to ¾ inch. One of Mr. Barton's lenses, by the way, has forty inches focus. More importance still is attached to the character of the collodion, developer, and bath employed. Mr. Barton employs collodion of standard makers, sometimes alone, sometimes mixed, but he invariably employs this, as also his iron developer, in an unusually ripe condition. To the collodion he always adds from half to one grain of bromide of cadmium per ounce. "The faults of architectural pictures, the inky shadows, &c., which you were mentioning just now," said Mr. Barton, "are always exaggerated if attention is not paid to this subject." The collodion must be yellow, and the developer yellow, but the bath must be as fresh as maybe. Mr. Barton employs a shallow horizontal bath—made simply of pine wood, varnished, with its crevices filled with marine glue—and, in busy times, he *makes up a fresh bath every day.*

"I always think doctoring baths waste of time," is Mr. Barton's opinion. However, he does two things invariably to ensure a good bath: he fuses his silver crystals himself, and only employs water of his own distillation, sometimes adding permanganate to the water before it is distilled. The bath is fully saturated with iodide before beginning to work, and the first plate immersed should be a success. A new bath is a condition to the production of brilliant and harmonious negatives.

Here is Mr. Barton's battery of lenses, and here is his range-finder, or rather lens-finder. The lenses are contained in a compact box; here is the single landscape, here the rapid rectilinear, the symmetrical, the wide angle, &c., each to be used upon occasion. As we have said, Mr. Barton employs a long focus lens when he can, but, like all of us, he has to bend to circumstances. He has taken up his station, fixed his camera, and has now to choose his lens. There is no hesitation, for his lens-finder tells him at once.

Here is a picture of it.



There is a brass frame-work, A; this embraces the picture you are to take, and, as you hold it up before you, you make it frame the view you want. On the rod, B, slides to and fro a sort of back sight, C, which has a small opening for the eye. You look through this back sight at the frame, A, sliding the back sight, C, nearer to or further from A, until you see the whole of the view you want. This done, you look at the scale upon the rod, and according where the back sight rests, so you choose the lens indicated on the scale. The instrument is a very simple one, and any photographer can make one for himself in the same way as Mr. Barton did, viz., by practically trying every lens with the instrument, and noting the result on the rod on which the back sight slides.

Mr. Barton has a simple and ingenious way of getting rid of vibration from a drop shutter; it is to provide the latter with an extra leg for itself, which thus renders it practically independent of the camera. This spare wooden leg is, indeed, a valuable bit of apparatus, for it serves, too, to give steadiness to a large camera when this is pulled out to its full extent and requires extraordinary support behind.

We have no time to tell of Mr. Barton's big apparatus, his tall solid stands—that for cathedral work is some fourteen feet in height—for there are the printing, mounting,

washing, and emulsion rooms to be visited. In the last, Mr. Barton reverses the order of things, having a light cupboard in a dark room, whither he can retire at will. The mounting is done in a somewhat original manner; it is the reverse of dry mounting. The prints, still wet, are brought into the mounting room, and laid, face downwards, on linen shelves, placed in tiers under the mounting counters. Here they dry flat. The large mounts of soft card are moistened over their entire surface; a girl dips a brush into hot glue—pale Russian glue is employed—and applies the liquid lavishly to the mount, without confining herself to the space shortly to be occupied by the print. The latter is similarly steeped in the transparent liquid, placed upon the cardboard, and then pressed down and the superfluous glue removed with a squegee.

We should like to have described Mr. Barton's low, sturdy tent—Mr. Barton follows Mr. Francis Bedford's capital plan of sitting down at work—his printing arrangements, his travelling apparatus, &c., but our space forbids. We hope, however, to return to the subject at no distant period, and meanwhile tender, on behalf of our readers and ourselves, cordial thanks for Mr. Barton's frank and kindly reception of us.

The "At Home" next week will be "At Millbank."

AT THE OPENING OF THE BRISTOL INTERNATIONAL EXHIBITION.*

Messrs. Valentine and Sons, of Dundee, are represented by the same graceful pictures of lake and glen they exhibited in London, together with yet other productions. Mr. J. C. Cox, also of Dundee, is represented by a cattle study, a group of rugged Highland kine, and some bits in Forfar and the Trossachs (144). Mr. Harding Warner's pictures include much fine work; "On the Esk" (146) is particularly good, and so too is the monster mass of granite, that quaint natural pile known as the Quirang, in the Isle of Skye (155). This picture, showing the bold weird peak, under vigorous treatment, is a wonderful bit of work.

Mr. H. Manfield is well represented by a magnificent series of interiors, of which the quaint old-fashioned ball-room at Haddon is our favourite. We do not care whether the story of Dorothy Vernon's elopement at the moment when that hall was full of ladies and gallants, of music, lights and dancing, of rustling silks and stiff brocades, of curled wigs and powder and patches, is well founded or not. We choose to believe it, at any rate; and every time the familiar scenes of picturesque Haddon come before us, the worn stone-steps, the trailing ivy, the dark, forgotten shrubberies, the wrought-iron gateways, the dear old banqueting hall, the historical courtyard, whence have ridden many a hunting train of brave men and fair ladies—the romance comes fresh to our memory. "We value photography because it brings before us the fairest scenes on earth," said the Mayor, on opening the Exhibition, and the Bristol Exhibition tritely illustrates his words.

The energetic Honorary Secretary, to whose indefatigable and untiring energies we have already borne testimony, does more justice to himself than he did in town this autumn. In the Valley of the Conway (172) he shows us a sweet weald of country, encompassed by brown hills and leafy foliage. The grey roofs of a picturesque village are at one's feet, the road winding down to the cottages, while a clump of black firs in the foreground gives contrast to the fair distance. "Wyckham Bridge" (174), the grey structure rising out of a still back water decked with water-lilies, is another rare composition. "Mantelpiece at Welsh Back," the carving represented with much delicacy and vigour, is also an attraction. Mr. and Mrs. S. G. Payne show several of their delicate flower compositions—some are too high for inspection—and two pictures of game and fish (187—8) which deserve high commendation, both on account of artistic grouping and skilful rendering. Mr. Trenemen has some exceedingly perfect work, rendered in silver, platinotype, and carbon; Virginia Water and St. Columb Porth (402) are particularly good.

Mr. John Jackson's pictures of "Border Scenery" (194-5) are a little too dark for our taste; but Mr. T. Davey's series include several examples of excellent work. "Evening," a stile leading into a wood, "the shadows falling fast," is a fine composition; and we like, too, "Our Rector" (196), calmly fishing in the stream by the village. Mr. R. Keen's work is well known to our readers, and at Bristol he proves himself a master in platinotype printing. Mr. E. Dunmore's quiet study, "An Evening on the Kentish Coast" (213), is familiar to us; and Messrs. E. Day and Son's clever contributions (125, 193, &c.) we have also seen before. The Rev. S. J. W. Saunders proves himself an adept at interiors, one of the most trying—if not the most difficult—branch of photographic art; Ely Cathedral, and Peterborough Cathedral (215), are both of them excellent pictures, the lighting cleverly managed, and the point of view happily chosen. A conservatory (225) is likewise a good picture, boldly treated, and finely lighted. Of Mr. A. Hill's contributions, we prefer the Tomb of Dean Wotton, at Canterbury (371), a specimen of clear, bright work, embodying much good taste and judgment.

Mr. William Mayland (74) sends his pictures of the busy Thames, so startling in their life and reality; Mr. W. R. Stork shows some pretty scenes, Lower Court Farm, with its white farm buildings and duck pond, being one of the most taking (219). St. Paul's Church, Stockport (223), pleases us most of Mr. J. S. Breeze's collection; while of Mr. G. F. Powel's thirteen "Nooks and Corners," for the most part studies of foliage, many are to be commended. Dr. Thompson's Tintern Abbey (227) is a capital picture, and so, too, is Main's Castle of Mr. A. Donald, whose good work is familiar to many; "In Grandma's Place," by the latter, also deserves to be mentioned. Mr. J. H. Ritchie's collection includes a fine sea view (239); and in Mr. Archibald L. Coke's landscapes we recognize some picturesque views of Clovelly (243-4) that everyone must admire. A fine picture of Lynmouth is catalogued "Relics of Old London," so we are unable to refer to its author; but close by, the Rev. H. B. Hare exhibits some rare studies of foliage and English flowers (266). Mr. A. Watkins shows "A Frosty Morning" (346) and other pictures; and Mr. T. B. Hutton has some excellent views from the Channel Islands, the wave-beaten rocks of Sark (278) being particularly well rendered.

Captain Abney has a series of Swiss views, of which the Dent Blanche (272), with its rough boulders and stunted pines, its rugged mountain side and lofty peaks, is the boldest and most graphic. In respect to these perfect little pictures, it may be recorded that the plates were prepared in March last and developed in October, the films being of bromo-iodide emulsion. Mr. Wastel Bull exhibits a good cattle study and some landscapes. The pictures of Mr. J. Millman Brown are familiar, but we must especially mention "A Glen Study" (304), a sylvan retreat with trailing foliage, well worthy of its author. The Platinotype Company and Woodburytype Company exhibit largely, and Mr. W. J. A. Grant sends some of his choicest Arctic views.

The exhibits of Mr. W. F. Donkin merit special attention; they are pictures and panoramas of the high Alps, of icy ranges and peaks of virgin snow. We have seen nothing so perfect in its way as the panorama from the Unter Rothhorn (208). The Alpine climber will be startled at the clearness with which the lofty heights are limned

* Continued from page 613.

and the stay-at-home may here peep over a cold, silent world of peaks and pinnacles, of whose existence he never reck'd. A snow cornice in the sunshine (247), one of the fairest scenes that the Alpine traveller can look upon, has been happily photographed by Mr. Donkin. Mr. Henry Dixon sends "Relics of Old London," and Mr. G. J. Dixon his wonderful Lions and Tigers. Mr. G. Mansfield shows the Bridge and Abbey, Westown (335), and other good pictures. Dr. Huggin, who is a staunch platinotype printer, shows some delightful little views from the Hartz (341), and Mr. McGhie, a rising young Scotch photographer, is represented by several excellent Italian views. Of Dr. Morton's series, we prefer Beauchief Abbey (349), in which the ruin is treated with much taste and skill; and of Mr. W. G. Coote's, that of the Dolgelly Road (359). Mr. Dew's best picture is a study of willow trees (425), and that of Mr. Guy, a child asleep after skipping (500). The mill pond, Turtven (373), with the grey smoke curling above the cottages, and an ivy-grown wall, is a sweet little sketch by Mr. C. P. Lucas, who contributes several other good pictures. Mr. H. Talmage has three studies, and Mr. E. Soutter has a frame of prints, Bridlyton Priory, an interior with mantelpiece (393) being a delightful picture. Mr. Fox forwards "A Quiet Pool" (399) and two other pictures, and Messrs. C. and F. Jones, besides their Thames studies, send some capital little sketches from a tour in North Wales (420). Mr. Albert Clout exhibits some quiet pastoral views, as witness Knole Park (422). An interesting series of botanical specimens is shown by Mr. F. H. Benison, difficult subjects treated with considerable skill. Some fine transparencies are exhibited by Colonel Stuart Wortley, Mr. H. N. King, and others; while Mr. H. N. White, of Cowes, contributes a most varied and valuable collection of ceramics—reproductions from paintings, as also from direct photographs—which amply illustrate the many applications possible in this important branch of the art.

Finally, before we quit this portion of the Exhibition, we must not forget to mention some excellent pictures from Southern Afghanistan, taken by the Sappers attached to the Field Force at Candahar.

To some of the pictures in the portrait gallery we have already referred. Mr. Robinson's "When the day's work is done," the picture that secured for its author the highest award—the gold medal—at the last Paris International Exhibition, and caused Mr. Robinson's name to be mentioned also for the Cross of the Legion of Honour, is here, as well as other happy conceptions of the same master. Mr. Norman May contributes some of his well-executed Malvern portraits; and Mr. Protheroe, a Bristol photographer of repute, exhibits much thoroughly good work in the shape of cabinets that speak well for local portraiture. Messrs. Hills and Saunders are also here, "Bosom Friends" being a delightful study (516), a chubby little lad embracing a dog. Messrs. Villiers and Quick have some so-called Rembrandt portraits; one of them a lady, with clear chiselled features, wearing a shawl of soft wool (512), is highly successful. Messrs. Chaffin and Son exhibit largely; "Going to School" (543), mother and son parting, being in our opinion the best. Mr. George Nesbitt has also a large collection that includes many fine pictures, of which "Tired Companions" (561), a little girl and dog slumbering together, is an old favourite of ours. Mr. Robert Faulkner's little folks impart the sunshine of their presence to the walls, and Mr. Samuel Fry is represented by several of his most successful pictures. M. B. Czechowsky, of Odessa, contributes several large and small studies, but we shall only criticise one of them, a cabinet, at the top of one of the frames. It is a girl in a light dress, her head and shoulders draped in a handkerchief. A sweet face, full of pathos and tenderness, is here, one whose clear eyes bespeak sympathy, and whose voice must needs be soft and melodious. The draping of the oval little face is artistic to a fault, and, in a word, the photographer has done justice to a heaven-born model.

Mr. A. Debenham sends most of the excellent pictures he forwarded to Pall Mall this year; and Mr. W. Gillard does likewise. Mr. Garrett Cocking is represented by his medal picture, the "Happy Pair," and several other of his familiar studies; and Mr. T. G. Whaite's drawing room and beach studies, which appear to attract medals wherever they go, are also in this room. Mr. T. C. Bromwich exhibits a frame of well-executed portraits; and Mr. J. Paton shows several carbon portraits on opal that deserve commendation. Of Mr. A. J. Fisher's pictures, we prefer the laughing little Italian girl with a tambourine, "Datemi Qualcosa Signori" (623). Mr. G. E. Alder shows two frames of excellent portraits taken by the Luxograph apparatus. Mr. J. M. Young displays some thoroughly good portrait work; one female head, of almost pure Grecian type, a portrait measuring 12 by 10, taken with a simple background of drapery (648), is a masterly effort. Mr. H. C. Mendelssohn, of Newcastle, is well known as an able portraitist; the grace of his models, the soft lighting, the delicate shadows, all call for the highest commendation; a case of cabinets (649), and of promenades (669), cannot fail to invoke the admiration of all visitors. Mr. Crouch exhibits specimens of touched and untouched negatives, which, we fear, go far to prove "how not to do it." Mr. F. F. Lloyd, Mr. H. Wheeler, and Mr. J. Lamb also exhibit good portraits.

In the Loan Collection are many interesting objects—an historical frame illustrating the Woodbury process, the Identiscope of Mr. Mathews, and a series of Daguerreotypes, by Baynham Jones. The Apparatus Room contains the clever shutter of Messrs. Hunter and Sands; some excellent apparatus for tourists exhibited by Messrs. W. W. Rouch and Co.; and improved bellows camera and pocket camera by Mr. George Hare; a coating machine for gelatine emulsion, the invention of Mr. H. A. H. Daniel; a universal studio camera, by Mr. Henry Moorse; a reversible background, by Mr. Avery; and other apparatus, &c., by Messrs. Husbands, Carl Bender, A Coke, Harding Warner, &c.

PAGET PRIZE COMPETITION.

DESCRIPTION OF THE PROCESS BY WHICH THE PLATES AND NEGATIVES SENT BY "EBLANA" HAVE BEEN MADE:—

To make a pint of emulsion, select a twenty-ounce, narrow-mouth, stoppered bottle, with a well-fitting stopper, and thin bottom; make it perfectly clean. Make a stock solution of—

Hydrochloric acid, pure	1 fluid drachm
(Hopkin and Williams' "Pure 1150 ordinary.")	
Distilled water	12½ ounces

Put into the twenty-ounce bottle 20 minims of the above dilute acid, 3 fluid ounces distilled water, 210 grains ammonium bromide (Hopkin and Williams', or Schering's dry), 80 grains Nelson's No. 1 Photo. gelatine. Leave for the gelatine to swell, say fifteen minutes or longer. In another clean glass vessel—beaker, measure, or flask—dissolve 330 grains of nitrate of silver (Johnson and Matthey's re-crystallized) in three ounces of distilled water. Pour out about two fluid drachms of this silver solution into another small vessel (say test-tube), and dilute it to half strength with an equal quantity of distilled water. Take the twenty-ounce bottle and the two lots of silver solution into the dark-room. The writer prefers to use a large paraffin lamp, protected by one thickness of ruby and one of dark orange glass, or two thicknesses of dark orange paper without any ruby. In the dark-room have a gas-boiling stove, and on it a tin pot or saucepan deep enough to contain the bottle when the lid is on. It should have a tin perforated false bottom to prevent the bottle resting immediately on the true bottom; or a piece of wire gauze will answer. Let the pot contain some three or four inches in depth of boiling water. Turn out the gas of the stove (if alight) and plunge the bottle into the water two or three times, so as to avoid cracking it by too sudden heating, then leave it in for a few minutes, until the gelatine is completely dissolved. Do not leave it in longer than necessary for complete solution.

Take it out, shake up, remove stopper, and set bottle down on the table near your lamp, so that you can see what you are doing. Pour in, all at once, the four drachms of dilute silver solution. Put in the stopper, and shake up thoroughly, but not too violently, for about half-a-minute. Now pour in the strong silver solution in quantities of about half-an-ounce at a time, shaking, as before, after each addition, and, when all is added, give a final thorough shaking for (say) a couple of minutes.

If the instructions have been so far accurately followed, there will be no coarse precipitate or grit in the finished emulsion. Now put the bottle into the pot of hot water, see that the stopper is not jammed in, and put on the lid. Light the gas, and boil up quickly as possible. If the water was previously boiling, and the gas only turned out for the mixing operation, it should boil up in less than five minutes; then keep boiling for fifty-five minutes. At the end of this time turn out the gas, take off the lid, take out the bottle, and remove the stopper at once, or you will not get it out afterwards. The bottle must now be cooled down as quickly as is consistent with safety to the glass. In very cold weather it may stand on the table for ten minutes or so, and then be cooled with water; or, in any weather, place it in a pan of nearly boiling water, and cool gradually by allowing cold water to trickle slowly in, shaking the bottle occasionally. Whatever method is adopted, it should be down to 90° Fahr., or lower, in fifteen or twenty minutes at most. It cannot easily be made too cold, as the gelatine has lost its power of setting. In a glass beaker (about twelve or fourteen ounce size) put one ounce of Nelson's No. 1 Photo. or "X opaque" gelatine, and pour over it ten ounces of clean, ordinary water. Leave to soak until the gelatine has absorbed four ounces of the water, pour off the surplus six ounces, melt the swelled gelatine by immersing the beaker in hot water, and pour it into the twenty-ounce bottle containing the cooled emulsion. Shake up well, and pour all back into the beaker, draining out the bottle thoroughly. Leave to set in a cool place. The writer prefers to leave for twenty-four hours. It has next to be washed. For the washing, clean ordinary water, at a temperature not over 50° Fahr., should be used. The writer prefers, at all times, to use water cooled down to below 40°, by melting ice in it. By so doing, uniform results are obtained, and, where ice can be procured, the cost is trifling; three pounds of ice will be sufficient for a pint lot of emulsion, in the hottest weather. In a glazed earthern pan, or other suitable vessel, put about three pints of cold water, and add three ounces of saturated solution of bichromate of potash, made by saturating ordinary water with bichromate (Hopkin and Williams' re-crystallized, at 1s. 4d. per pound). Having cooled the beaker of set emulsion down to 40° Fahr., run a bone spatula or paper-knife round and turn out the emulsion, or cut it out in lumps. If cold, it will come out almost quite clean from the glass. Place it on a piece of coarse straining-cloth or canvas, and squeeze through the meshes into the water, the operation being performed under the surface of the water. Leave it so for an hour. Lay the straining-cloth over the mouth of another pan, or large jar, and pour the mixture of emulsion threads and liquid on to it, so as to let the latter run through. Squeeze the emulsion a second time through the cloth into clean cold water, and immediately repeat the operation a third time, leaving the emulsion in the last water for half-an-hour. When strained for the last time, place cloth and all in a large beaker, and put the latter into hot water until the emulsion is completely melted and warmed to about 115° Fahr.; *i.e.*, not warmer than is pleasant to the hand. With a clean hand, take out the cloth and squeeze it: very little will be lost. The emulsion should now measure about sixteen or seventeen ounces. Add two ounces of aclohol, and mix thoroughly. The alcohol may be either pure ethylic alcohol sp. gr. about ·830, or good colourless methylated. The writer prefers the former. If the emulsion now measure less than twenty ounces, make it up to that by adding clean water. The emulsion is now ready for use. It should be filtered into the coating-cup through cotton-wool, to free from bubbles, and plates coated in the usual way, dried and used as usual for rapid gelatine plates, using about an ounce of emulsion for a dozen quarter plates. In drying arrangements, avoid the contact of gas, or of the products of combustion of gas, with the moist plates. The writer finds both to be very injurious.

Exposure.—As usual for good gelatine plates, say Wratten and Wainwright's "instantaneous."

Development.—Either pyrogallic, ammonia and bromide, or ferrous oxalate. If the former, sufficient exposure and as little ammonia as possible will give best results.

Note as to Gelatine.—The plates sent were made as above, "X opaque" being used as described. This is necessary in hot weather, but the writer prefers to work in cold weather, and then uses only Nelson's No. 1 Photo.

Further Details and Explanations of Process sent by "Eblana."

Bromide of Ammonium should be as nearly as possible neutral. It is usually more or less acid, even though otherwise pure, and frequently becomes strongly acid by keeping. It is then quite unfit for use, and will not give good results unless almost neutral. Having a quantity of bromide of ammonia, which had by keeping grown acid and unfit for use, the writer tried to cure it by making a solution in water saturated at 100° C., adding liq. ammonia until the solution smelled strongly of ammonia, and leaving to crystallize out. When cold, before pouring off the mother liquor, a piece of blue litmus paper dipped into the latter showed it to be fully as acid as the salt had been before—a result which the writer is unable to explain. Since sending in the formula for competition, the writer has arrived at the conclusion that on the whole it is better to use bromide of potassium. The latter is often alkaline, but may without much difficulty be obtained neutral, and is free from tendency to alter.

Nelson's No. 1 Photo. Gelatine unfortunately varies much in different samples. It should be absolutely free from the faintest smell or taste, and should dissolve clear, bright, and nearly colourless. Samples good for this purpose are very slightly acid with HCl (*i.e.*, contain a trace of it).

Nitrate of Silver is usually (if good) slightly acid with excess of nitric acid. It may be so used, but the writer has recently found that better results are obtained if the silver solution be neutralized with carbonate of soda. A slight excess does no harm, as the resulting trace of carbonate of silver is converted into bromide; indeed, an emulsion may be made by mixing washed carbonate of silver with a soluble bromide. The uses of neutralizing the silver are twofold: one is, that as the amount of acidity of $AgNO_3$ varies with different samples, it ensures the same conditions in all cases; the other is, that the presence of nitric acid in emulsion produces a tendency to green and pink discolorations in the finished negative.

The addition of a trace of HCl to the soluble bromide and gelatine is recommended in formula given, for the following reasons. If the soluble bromide be absolutely neutral, and the gelatine a suitable sample (see *ante*), the HCl is not necessary, and better omitted. If, however, the gelatine be ever so little alkaline or even apparently neutral, but yet does not dissolve clear, the acid is required. Its use is not to produce AgCl, but to ensure a fine precipitate of AgBr. According to the writer's experience, a fine precipitate is hardly at all a question of the method of mixing, and elaborate contrivances for the purpose he considers as quite unnecessary. A fine precipitate is easily obtained, however rapidly the solutions be mixed, if two conditions exist, viz., if the bromized gelatine solution contain a trace of HCl, and the silver solution be not stronger than 110 grs. per oz. If it be 50 to 60 grs. per oz., it may be poured in all at once, or if a little weak solution be first poured in, the stronger may follow (as per formula). A good test for the suitability of a gelatine is to see if a fine precipitate can be obtained without having to add HCl. Too much HCl retards or prevents the conversion of the AgBr into the sensitive form in cooking, a large excess destroys the gelatine. It will thus be seen that the addition of HCl must be made intelligently, according to the other materials accessible. It might be supposed that any acid would make the precipitate fine, and that therefore acid ammonium bromide would be good. Such is not the case, and moreover, the acid bromide has in some way a powerful effect in retarding the conversion of the AgBr into the sensitive form.

The proportions of soluble bromide and $Ag\,NO_3$ are very important. Contrary to usual statements, the larger the excess of soluble bromide the more quickly is the Ag Br converted; if there be but little excess, a very long cooking will be required; and if exactly the equivalent quantities could be used, the writer believes that no amount of cooking would give the sensitive condition. Too large an excess, on the contrary, produces a form of a tendency to fog, which is not to be afterwards got rid of by the use of bichromate, but which is more liable to occur with alkaline pyrogallic developer than with ferrous oxalate. Hence the amount of excess bromide must be proportionate to the time of cooking. The writer finds from 110 to 113 grains of $Ag\ NO_3$ to 70 grains $NH_4\,Br$, and from forty-five to sixty minutes' boiling, give him best results. If K Br be used, he recommends 86

K Br to 110 Ag NO_3. The addition of remaining gelatine, after boiling, should be made when the boiled emulsion and dissolved gelatine are both at as low a temperature as possible, and, between the time of this addition and that of washing the emulsion, it should be kept as cold as possible. The reason of this appears to be that the excess of alkaline bromide has a most destructive effect on the new gelatine, and, therefore, the lower the temperature, and shorter the time during which the two are in contact, the better. There is a curious effect depending on the temperature at which the emulsion and fresh gelatine are mixed, viz., that if quite cold, the resulting plate will have a matt surface, and the higher the temperature the more glossy it will be. A plain solution of gelatine in pure water is very little injured by prolonged boiling; but if an alkaline bromide or chloride be added, it is speedily decomposed. Probably the alkaline nitrate, which is present in the emulsion in large quantity, may be even more effective.

Washing.—Before squeezing the set emulsion through the canvas, it should be cooled down so as to be as firm as possible. If so, the water into which it is squeezed will remain almost clear, or but slightly milky. If the emulsion be soft, even though the water be ice cold, the water will be more milky, and the emulsion take up too much. Too much HCl, excess bromide, too high a temperature of addition of gelatine, or keeping at too high temperature between adding and washing, will produce the same result. The emulsion may, of course, be washed by precipitating with alcohol, squeezing the clot, breaking it up, and soaking in water; but the writer prefers washing with water and bichromate—as described—on account of the clear and brilliant shadows so obtained.

Remelting the Washed Emulsion.—A good deal depends on the temperature at which this is done, and, by careful management, much may be done. If the emulsion be sufficiently rapid, and free from pink-and-green disease, it is best melted and coated at a low temperature. If it be slow, and has a tendency to colour, it will be improved by heating to 140° Fahr. The writer has had emulsions which became more than three times as rapid by this treatment; but it is a somewhat dangerous one, as too high a temperatnre, or too prolonged heating, may result in a hopeless grey fog. This kind of fog is more apparent during development than after fixing.

Note.—The gelatine added after boiling must be dissolved before adding. If merely swelled and added to the boiled emulsion, the latter being just warm enough to dissolve it, the result is, in several ways, not so good.

Correspondence.

THE COLOUR PHOTOGRAPHIC COMPANY.

Sir,—With reference to the remarks which appeared in your issue of last week, I am instructed by the Directors to state that they have never said or implied that the colours in portraits taken by this Company's patent process are produced in the camera. The Directors cannot be held responsible for unauthorised statements, made without their knowledge or sanction, which have appeared in one or two newspapers. These must have been contributed by their respective reporters or representatives who were present at the *conversazione* given on the 12th inst. While the Directors regret the mistake, they entirely disclaim its authorship. At the same time, they venture to invite your readers and the public to visit the studio, at 1, Park Side, Knightsbridge, and judge for themselves of the specimens there on view.—Yours &c., Jno. Sittis, Secretary.

PHOSPHORESCENT EMULSION.

Sir,—In your article on "Phosphorescent Emulsion," page 618 of your last issue, I very much object to the term *crude*, seeing that my experiments with that substance extend to five hours' work a day for nearly twelve months in a room almost, and in most cases absolutely, dark. (I leave your readers to judge what effect this would have on a temperament like mine.) The details of said experiments would fill upwards of two volumes of the News. I am well aware that I might have summoned (by a great flourish of trumpets) a meeting at the Society of Arts, or some other society, to demonstrate the possibility of taking photographs through a pinhole stop instantaneously in a room lighted up with gas; but I much prefer my own way of making my discovery known, and, I must say, your readers who are not members of the Photographic Club miss a great deal by the non-publication of the proceedings. I utterly fail to see how any other method of compounding the phosphor calcium argentic emulsion can succeed, for if one layer is superimposed on another the light will not reach both, and consequently no rapid action takes place. When the moonlight photography controversy is more advanced, I would like to say a little on the subject—*i.e.*, if you think the matter of sufficient importance. Apologising for trespassing on your space, I remain, yours respectfully, A. L. Henderson.

[The term "crude," as will be seen on reference to the page Mr. Henderson indicates, refers not to Mr. Henderson's project or experiment, but to the chemical incongruity of mingling gelatine emulsion with the sulphide of an alkaline earth.—Ed. P. N.]

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

Sir,—Will you allow me to call the attention of your readers to the Annual Lantern Exhibition of the South London Photographic Society, to be held on Thursday next, January 6th, at seven o'clock, in the large room of the Society of Arts, Adelphi. Slides will be exhibited by members and others. The admission, which is free, will be by tickets, that can be obtained from—Yours truly,

High Street, Lee, S.E. H. Garrett Cocking, Sec.

To Correspondents.

*** By reason of the Index, which appears this week, the "Topic," "In and Out," "Notes," &c., together with severa "Auswers," have been compulsorily postponed.

W. G. Honey.—The specimens possess great merit from an artistic point of view, and the rapidity with which they can be turned out is a considerable advantage; but the coloured specimen does not please us so much as those which have not been operated on. Without being in possession of full details as to the nature of your method, it is impossible to say whether it is patentable or capable of being protected in any way. The cost of taking out a provisional protection for six months may be estimated at nearly £10, if you employ a patent agent to take the matter through for you.

J. Jones (Manchester).—The particulars you ask for are all to be found in our Year-Book for 1881. See the article "Gelatino-Bromide in a Nut-shell."

A. Torrens.—The apparatus was shown at a meeting of the Photographic Club; but, as far as we can ascertain, no description has yet been published.

A. F. P.—You scarcely require any fittings beyond a few sinks and dishes; these latter being so arranged that a stream of water flows constantly through them. You will find that wooden dishes, lined with gutta-percha, answer admirably, but there are grave objections to the use of zinc or tin trays.

W. Bradshaw.—The print which you send does not do justice to the negative from which it was printed, the principal defect being the washing away of all the lighter shades of the picture, large portions of the white paper being thus left quite bare. This may arise, like the spots, from a radical defect in the tissue, or it may be due to an over-rapid development with water which is too hot. The first-mentioned evil may be lessened by keeping the tissue for some days before using it, in order that the earlier steps of incipient insolubility may set in. The same kind of tendency towards insolubility can be favoured by slow drying, the use of an old sensitizing bath, and the absence of free ammonia therein. In the case of an ordinary sample of tissue, the drying should be effected in about six or seven hours, while your tissue would work better if things were so arranged as to make it dry in twelve to fifteen hours.

Sunshine.—The instrument introduced by Mr. Warnerke will probably suit your purpose best. Messrs. Marion and Co. manufacture it.

Jas. Fraser.—Your intentions are very laudable, and you will find that Roscoe's Elements of Chemistry, published at about 4s. 6d., will serve your purpose admirably as a first book. When you have carefully read this, and worked out the problems contained in the appendix, let us hear from you again.

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